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27TH ANNUAL REPORT

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OF THE

MISSOURI

STATE BOARD OF AGRICULTURE

FOR THE

YEAR 1894.

JEFFERSON CITY:
TRIBUNE PRINTING COMPANY, STATE PRINTERS AND BINDERS
1895.

STATE BOARD OF AGRICULTURE.

EX OFFICIO MEMBERS.

WM. J. STONE, Governor.
PROF. JOHN R. KIRK, Superintendent Public Schools.
DR. PAUL SCHWEITZER, Dean Agricultural College.

DISTRICT MEMBERS APPOINTED BY THE GOVERNOR.

District.	Name.	Postoffice.	Term Exp.
First	D. A. Ely	Sublett	July, 1894
Second	H. C. Ireland	Chillicothe	July, 1896
Third	Alex. Maitland	Richmond	July, 1896
Fourth	Eugene Rhoades.	Fairfax	July, 1894
Fifth	J. F. Groves	Corder	July, 1896
Sixth	F. E. Bybee	Harrisonville	July, 1895
Seventh	Wallace Estill.	Estill	July, 1894
Eighth	L. F. Luthy	Lebanon	July, 1894
Ninth	J. A. Potts	Mexico	July, 1895
Tenth	A. W. Meyer	Labadie	July, 1895
Eleventh	Norman J. Colman	St. Louis	July, 1895
Twelfth	Joseph Donovan	St. Louis	July, 1895
Thirteenth	W. R. Wilkinson	Altenberg	July, 1896
Fourteenth	P. N. Gully	Hutton Valley	July, 1896
Fifteenth	C. P. Cook	Round Grove	July, 1894

OFFICERS.

Alex. Maitland	President	Richmond
D. A. Ely	Vice-President	Sublett
J. R. Rippey	Secretary	Columbia
Snowdie B. Willis	Assistant Secretary	Mexico
H. H. Banks	Treasurer	Columbia
T. J. Turner	Veterinarian	Columbia
Maud Rippey	Stenographer	Glenwood
A. E. Hackett	Meteorologist	Columbia

EXECUTIVE COMMITTEE.

Wallace Estill	Estill	D. A. Ely	Sublett
J. A. Potts	Mexico	Dr. Paul Schweitzer	Columbia

Alex. Maitland..... Richmond.

LETTER OF TRANSMITTAL.

OFFICE STATE BOARD OF AGRICULTURE,
COLUMBIA, MO., April 1, 1895.

WM. J. STONE, Governor of Missouri:

DEAR SIR: I have the honor to submit to you the twenty-seventh annual report of this Board, giving a resume of their work and noting agricultural conditions for the year 1894.

The Board has earnestly devoted its energies and best thought to the advancement of the agricultural interests of the State, has aided, so far as it was possible, the State agricultural associations; has endeavored to judiciously and economically expend the appropriations made in its interest, and confidently expects profitable returns for the work done. To your aid and encouragement, to the deep interest evinced by you in agriculture, and to your counsel and advice upon all important measures, may be credited, to a large extent, what success may have been achieved.

With confidence in the future of agriculture in Missouri, a firm belief that phenomenal results await the full development of our agricultural and mineral resources, that Missouri is destined to be the fruit orchard and stock-breeding nursery of the world, and take prominent rank in all other departments of agriculture, I have the honor to be,

Very truly yours, etc.,

J. R. RIPPEY.

ANNUAL MEETING.

State Board of Agriculture met in regular session at 4:30 p. m., January 8, 1895, at office of Secretary. President Estill was absent on account of severe illness of his wife, and Vice-President Maitland called the meeting to order. The following members responded to roll-call: Gov. Wm. J. Stone, W. R. Wilkinson, Alex. Maitland, J. F. Groves, F. E. Bybee, D. A. Ely, J. A. Potts, L. F. Luthy, L. E. Wolfe, Eugene Rhoades and Dr. Paul Schweitzer, Dean of the Agicultural college.

Minutes of preceding meeting read and approved.

The Secretary submitted the following report of work in his office, and a financial statement showing receipts and disbursements for 1894, which were received and placed on file:

REPORT OF SECRETARY.

To the State Board of Agriculture:

I herewith submit to you a report of the work of this department for 1894, together with such suggestions as would seem pertinent and of value at the close of this biennial period, and upon the assembling of theThirty-eighth General Assembly.

FARMERS' INSTITUTES.

In 1893 there were calls for institute work from seventy-six counties in the State; and for 1894 from eighty-six counties. Quite a number of counties that could not be accommodated with the work this season have placed their application on file for the series of 1895. There was a notable increase in the attendance over last year, and a deeper and more extended interest in the work. The agricultural and horticultural exhibits at most of the meetings were large, varied and

creditable to the localities, and would have done honor to Missouri if placed on exhibition with the products of sister states.

The speakers were earnest and efficient men, devoted to the work, and commanded the confidence and attention of the agriculturists to whom they talked.

Hon. T. B. Terry, of Ohio, Dr. T. J. Turner, State Veterinarian, Dr. R. A. Ramsay, of Mexico, Col. G. W. Waters, of Canton, Emerson T. Abbott, president North American Bee Keepers' Association, W. F. Whitney, of Mexico, Mo., John Patterson, of Kirksville, Levi Chubbuck, of Kidder, Clint. H. Chubbuck, of Kansas City, attended most of the meetings in the State. A. Nelson, of Lebanon, addressed the meetings at Lebanon and Marshfield, Z. T. Russell and A. W. St. Johns the meeting at Sarcoxie, and T. B. Chandler, Farmington and Perryville. At a number of meetings we were aided by valuable local talent. Hon. J. A. Potts addressed the meeting at Laddonia on "Nobility of the Farmer;" Prof. F. W. Hannah at Milan on "Education in Agriculture;" Hon. Abner Smith at Palmyra on "Agricultural Depression;" Mrs. D. H. Webster at Harrisonville on "Why the Boys Leave the Farm;" Senator F. E. Bybee also delivered an able address at Harrisonville. Judge Miller furnished a paper on horticulture.

A meeting held at Higginsville in co-operation with the State Dairy Association was well attended by the practical dairymen of the state. It was addressed by Dr. T. J. Turner, State Veterinarian, Dr. R. A. Ramsay, John Patterson, Prof. Walter J. Quick, C. W. Murtfeldt, Wm. Bruns, G. B. Lamm, D. W. Wilson, Aaron Woodhull, L. W. Hayden and other prominent speakers—the discussions that followed resulting in an exchange of ideas amongst the dairymen themselves that will certainly result in profit and advancement.

Another meeting was held in Macon in connection with the annual exhibit of the State Poultry association. This meeting was attended by the breeders and representatives of the poultry industry throughout the State, and was convened in Macon county, which led all other counties in the production of poultry and poultry products in 1893. The discussions embraced every subject that was probably worthy of consideration in connection with this industry, and was participated in by A. J. Blake, Geo. W. Fry, C. A. Emery, Alex. Maitland, Judge Theo. Hewes, Judge J. W. Wale, Mrs. Emma Foster and others.

The exhibit was, to say the least, highly creditable and well worthy of a state that leads her sister states in the number of barnyard fowls, and in 1893 produced for home consumption and shipment several million dollars' worth of poultry and poultry products. That this enormous sum may be increased, and produced with such economy as

will lead to greater remuneration and profits, it is hoped will be the result of this and similar meetings.

We have also arranged a meeting in the interest of good roads, co-operating with the State Road Association, which will probably be held in this city early in the coming season, the meeting having been postponed from a date previously fixed to such time as we might be able to have the manufacturers of road machinery present with their road implements, when those attending might see in operation everything intended for the economical and better making and repairing of our highways.

The members of the State Road Association are expected to be present, and we will endeavor to have a representative from every county court in the State, and shall urge the attendance of road overseers, and those interested in constructing and maintaining a more creditable system of public highways.

Another meeting will be held in the interest of the swine-breeders and in co-operation with their State Association. The diseases of swine that have robbed the industry of much profit, improved breeds and their value, and improved manner of feeding and growing, will be discussed by experienced and practical breeders.

Proper sanitary measures and thorough meat inspection will be considered with a view of extending the market for hog products to more profitable fields, from which we have been practically excluded.

AGRICULTURAL CONDITIONS, 1894.

WHEAT.

The acreage sown in fall of 1893 was estimated at 1,652,694 acres, and there was harvested 1,539,339 acres, yielding 23,090,035 bushels, making an average of 15 bushels per acre. While the acreage harvested in 1894 had decreased nearly 200,000 acres from 1893, there was an increase in yield of over 4,000,000 bushels. It is estimated by farmers and feeders of the State that 20 per cent of the crop, or approximately 4,600,000 bushels, will be fed to stock. If the winter remains open, it is probable that this estimate is largely in excess of what will be used in this way.

There is a decrease in the acreage sown in the fall of 1894 of about 100,000 acres; but the seed was put in the ground in good condition, the conditions have been favorable, and the plant looks well.

CORN

Was never planted under more favorable circumstances; the season was early, the ground in excellent condition, the seed germinated well, and there was but little complaint from destructive insects.

The acreage was estimated at 107 per cent as compared with 1893, and this was, to say the least, a conservative estimate—probably below the actual acreage—but gives us a total area of 6,099,000 acres and yield of 140,277,000 bushels.

Favorable conditions and the promise of a phenomenal yield continued to July 1. From this date the drouth, which had been but lightly felt in localities, became more general and disastrous in its effects. August 1 showed a decline in condition of 10 points. September 1 the drouth continued unbroken, and was at this time probably unprecedented in the history of the State, with the severest damage in the northeast, northwest and central sections of the State, the southwest section having suffered the least.

Reports for October 1 note some improvement in the crop, and final reports estimate the yield at 23 bushels per acre or a total of 140,277,000 bushels, and 49 per cent of the plant cut for fodder.

OATS

Covered an increased acreage, the conditions for seeding were favorable and the ground in almost perfect condition. In most of the State the grain had been sowed and had germinated, or the plant up, when came the disastrous freeze of March which, as our correspondent puts it, "extinguished the crop like the blowing out of a candle."

In some of the northern counties the seed was not so far advanced and the grain yet remaining dry and unsprouted was not injured. But the acreage for the state had been materially reduced and the cold, dry weather that followed did not stimulate that strong, vigorous growth necessary to overcome the damage sustained.

Final estimates gave an area 1,116,700 acres; conditions 60 per cent of an average crop, and a yield of 25 bushels per acre, or a total of 28,000,000 bushels for the State.

HAY.

Timothy and clover suffered severely by reason of the drought. In some instances meadows were worthless other than for the pasturage they would afford, and no locality was able to report a full crop. The quality was good, was harvested in fine condition, but there was a very general complaint of an admixture of too much blue-grass and

red-top. A good acreage of millet and hungarian was sown, yielding only a fair crop. The acreage for meadows was 2,620,650 acres, with a yield of nine-tenths of a ton per acre, or a total yield for the State of 2,358,000.

TOBACCO.

Plant beds generally produced strong, vigorous plants, fields were well prepared and the estimated acreage was 93 per cent of the crop of last season or approximately 10,000 acres, yielding 700 pounds per acre, or a total of 7,000,000 pounds for the State. Generally the crop was well matured and was housed without loss.

COTTON

Is grown in but few counties in the State, but is of a superior quality and commands a price in advance of fiber grown elsewhere. The area for this season was 94 per cent of 1893. Condition, 86 per cent of an average crop, and the yield estimated at 625 pounds per acre.

POTATOES.

The acreage was large. Some early planted made large yields, while bugs and drought very seriously injured others. The estimated acreage is 94,000 acres; yield, 69 bushels per acre, or a total for the State, 6,490,000 bushels.

RAINFALL.

Each month of the crop-growing season marked a deficiency in precipitation, except September—the greatest departure from the normal being in August, and amounting to 1.81 inches for that month, and the locality noting the greatest deficiency being the Northwest section. The following table shows the precipitation by months as compared with the normal for this State:

	April.	May.	June.	July.	Aug.	Sept.	Oct.
Normal.....	3.45	4.74	4.83	3.90	3.39	3 15	2.85
1894.....	3.17	3.99	3.92	2.48	1.58	4 93	1.74
Deficiency.....	.29	.75	.91	1.42	1.81	.....	1.11
Excess.....	.....	.....	.....	.....	.....	1,78	

LIVE-STOCK,

In numbers, as compared with 1893, is as follows: Horses, 99 per cent; cattle, 91 per cent; hogs, 98 per cent; breeding sows, 102 per cent; and sheep, 90 per cent.

All stock have been in fairly good condition and comparatively free from contagious or infectious diseases.

Through the late fall and early winter there has been some loss of horses and cattle from indigestion. This trouble was confined to no locality, but was well distributed over the State, and the stock was frequently dead before it was known to be affected. In most cases this is supposed to be the result of too liberal use of corn fodder, that for some reason, is not so digestible this season as usual.

RECAPITULATION.

We have this season, notwithstanding the prevalence of an unprecedented drouth, produced 23,000,090 bushels of wheat of a very superior quality; 140,227,000 bushels of corn; 28,000,000 bushels of oats; 2,358,000 tons of hay; 7,000,000 pounds of tobacco; 6,490,000 bushels of potatoes; and while we are unable to give the acreage of cotton, the yield was fair and the quality superior. Our live stock goes into winter in good condition. We have an abundance of feed for our own stock, in some localities good pasturage, but a large portion of the State is scarce of stock-water.

We have supplied three millions of Missourians with an abundance of bread, of beef and pork products, dairy products, poultry products, fruits and vegetables, and shipped from the State last year, for the consumption of others, $31,250,000 worth of cattle; $20,000,000 worth of hogs; $4,000,000 worth of horses; $1,000,000 worth of sheep; $3,000,000 worth of poultry products; $1,000,000 worth of wool; and $1,000,000 worth of dairy products.

STATE WEATHER SERVICE.

Work in this department has been carried on along the same general lines as heretofore, but lack of funds has prevented any material extension except in the distribution of forecasts by mail, the necessary supplies for which were furnished by the National service.

During the year, seven new voluntary meteorological stations have been established, and eight stations have been discontinued, leaving a total of 102 stations now in operation. Of these, 50 are equipped with maximum and minimum thermometers and rain-gauge, 29 are equipped with exposed thermometers and rain-gauge, and 23 have rain-gauge only.

Several new stations should be established in the south-central portion of the State, that section being but poorly represented at

present, and those observers who are now using thermometers of the cheaper patterns should be furnished standard instruments. Many of the rain-gauges now in use are also so cheaply made as to be easily rendered totally unserviceable, and in the interests of accuracy and economy should be replaced with gauges of a better pattern.

Numerous applications for instruments are now on file from persons who desire to act as voluntary observers, and who are located at desirable points, but no stations can be established until a further supply of instruments is available.

The monthly bulletin of the Service, a neatly printed 9×13 inch, eight-page pamphlet, has been issued regularly during the year, about 225 copies being distributed each month. This bulletin contains meteorological and climatological data of much value and interest to all classes of business men, and especially to the farmer; and in order that the work of the Service may be made of the greatest possible value, and that the people of the State may know and appreciate the benefits to be derived therefrom, a material increase should be made, both in the size of the publication and the number of copies distributed.

The weekly weather-crop bulletin was published during twenty-six weeks of the crop-growing season, the first number being issued on April 10 and the last on October 2. This bulletin is based on special weekly reports received by mail from a corps of over 800 correspondents, and gives a concise statement of the weather conditions that have prevailed during the week, and their effect upon the growing crops. Owing to a lack of funds, only 750 copies of the bulletin were issued weekly during the past season, the service depending upon the press of the State for the further dissemination of the information. This publication is one of the most important features of the State weather service work, and to make it of the greatest benefit to agricultural interests, it should be given the widest circulation possible. The information which it contains is eagerly sought by the speculator, and in order that the farmer, in whose interest the bulletin is published, may keep fully informed as to the condition and progress of the different crops, special attention should be given to the dissemination of the information throughout the rural districts. At least 3000 copies of the bulletin should be issued weekly during the crop-growing season, in order that a copy may be posted in every postoffice in the State.

The distribution of forecasts throughout the State has been greatly extended during the year, and there are now over sixty stations receiving the forecasts and warnings by telegraph, at government expense, for the purpose of displaying weather signals. Thirty of these

stations have also been established as centers for the distribution of forecasts by mail, and over three hundred of the smaller towns and villages of the State are now receiving the forecasts daily in this manner. The necessary supplies for carrying on this work are furnished by the National service, and the work is performed gratuitously by the displaymen.

A further increase in the number of stations receiving the forecasts by telegraph at government expense has been authorized by the Chief of the Weather bureau, under conditions that whenever possible, the necessary flags be furnished without expense to the National service, and that the stations be established at points from which forecasts can be distributed by mail.

STATE VETERINARY SERVICE.

At the close of 1894 the State Veterinarian briefly reviews to me the work of his department for the last season, from which I submit the following. His detailed statements are on file in this office, and will be given to the public in the annual report:

	1893	1894
Diseases treated	24	27
Contagious diseases	3	8
Glanders and farcy	109	134
Tuberculosis	3	3
Actinomycosis	2	1
Texas fever	0	25
Anthrax	0	7
Texas itch	0	1
Strongulus falaria	0	110
Swine plague	0	62
Counties visited	50	41

In comparing this with last year's report, it will be seen that but little, if any, decrease has been met. This is not to be expected each year of this service, as it is now by law regulated, depends to such a great extent upon the demands made by citizens, and does not admit of much work done otherwise. Again, as science has progressed, and more positive means of detection of certain diseases are ascertained, we are more able to detect all cases than before. The field work has

not been great, and has been confined to certain localities to a greater extent than ever before.

The financial condition of the Service will be found to be in a healthy condition, there being some money not expended. Experimental work, though but small in amount, is largely satisfactory and conclusive, so far as carried, and we have done all that we dared attempt with the appropriations made. The history and report of experimental work done that we are prepared to offer a report concerning, will be found in the annual report on diseases, etc.

Besides the regular deputies appointed, some special men have been appointed for special work—deeming it was cheaper to do the work thus, being the cause of their appointment.

During the fall of 1894, a disease (due to the innutritiousness of much of the corn, also of the fodder), indigestion, has been very prevalent, and has caused much loss of stock. Though not contagious, the State has frequently been called upon for assistance, and in endeavoring to render all assistance possible, several newspaper articles have appeared, which, it is hoped, served the purpose for which they were written.

CO-OPERATION WITH STATE BOARD OF HEALTH.

In the Missouri Sanitarian, dated December, 1894, a publication issued by the State Board of Health, under the head of suggestions approved by the Board and ordered to be submitted to the Executive of the State and the General Assembly, I find the following recommendation:

> It is deemed advisable to recommend that the State Veterinary Surgeon be made subject to the orders of the State Board of Health whenever any condition in the State concerning the diseases of live-stock and the diseases of milk and meat shall, in the judgment of the Board, demand the co-operation and assistance of this officer.

After conferring with members of the State Board of Health, we understand that they will ask the Legislature to authorize this Board to detail a veterinary surgeon, when needed, to aid them in making investigations of diseases of live-stock when such diseases may be liable to affect the health of the human family. I've no doubt but you will commend their efforts to give our people pure food, and be ready to aid them in every possible way to secure better sanitary service.

The only change necessary in the law, in order to secure what is asked by the Board of Health in conference, is authority for this Board to instruct the State Veterinarian to look after cases presented by the State Board of Health, as it now does other cases provided for by law.

Great care should be taken in the preparation of such provision, that no conflict of authority should occur over this service.

The recommendation of the State Board of Health that the "State Veterinary Surgeon be made subject to their orders" conveys the idea, differing, however, from what they have said in conference, that they want absolute control of this officer.

If this is their intentions you will remember that this service was placed under your charge as representatives of the live-stock industries of the State, and that you, being largely interested in the breeding and handling of live-stock, and having a direct interest in their profitable management, would protect your herds, guard the sanitary conditions of your stock, extirpate contagious and infectious diseases, and provide against their introduction, and in every particular enforce the veterinary law with more promptness and energy than others not having this interest.

If the State Board of Health expects the veterinary service to remain as now, under the control of this Board, and only asks that we give them the services of the Veterinarian when needed, then the change suggested above authorizing you to direct the State Veterinarian to look after cases presented by the State Board of Health, is all that is necessary, and the service will be as available to them as to other interests of your State.

But to transfer the veterinary service to the State Board of Health, or give them full control of the State Veterinary Surgeon, or, as they request, "make him subject to their orders," in such manner as would lead to a conflict of authority, should be met with your prompt disapproval and earnest protest.

CROP REPORTS.

The crop reports required by law to be issued from this office are valuable to farmers and dealers in farm products only as they approximate correctness. There is a very general demand, practically unanimous among agriculturists, that these reports be made as authentic as possible, that all the facts, and facts only, be given, and that at the earliest practical moment after its compilation. We have no means of obtaining the acreage of crops in this State, except by taking the government report collected in 1889 as a basis and computing the area from the percentages reported to this office since that date. We have reason to believe that in some instances these estimates are, to say the least, misleading.

My predecessor called your attention to the necessity of a law requiring assessors to collect acreage of all crops grown in Missouri.

Such a law is in force in several of our sister states, and gives their reports a value and prominence not commanded by ours. The enactment of such a law for this State, providing for the collection of this information by the assessor once in every biennial period upon blanks published from this office, and to be returned here for compilation, would add much to the authenticity of our reports and give us advantages now possessed by other states.

AGRICULTURAL SOCIETIES.

Section 7 of the Session Acts of 1893 requires this Board in annual report to publish an abstract of the proceedings and condition of the several agricultural societies of the State.

Section 4058, Revised Statutes, requires these societies to annually report to this Board "the number of members and the financial condition of their societies, quality and character of property owned, quality and cost of improvements, number and value of premiums awarded, number and character of animals and articles exhibited," etc.

I regret to say that some of these societies have failed to make reports as required, and kind words and urgent solicitations have availed nothing. In other instances we get returns after repeated requests, but then probably too late for publication in annual report.

I can suggest no remedy for failure to comply with these requirements of the law other than a forfeiture of their charter, and it is possible that such provisions will have to be enacted before we get full, complete and authentic reports from all these associations.

INDUSTRIAL ASSOCIATIONS.

The State Dairy Association, in session at Higginsville, by resolution, requests that you urge a biennial appropriation of $2000 to be made to your Board in the interests of the dairy industry of the State.

Similar resolutions asking for aid in the development of their respective industries have been passed by associations representing other departments of agriculture. I would suggest that these resolutions have your careful and earnest consideration. They are the requests of men who represent the energy and industry of this great commonwealth. These several industries, when fully developed, will employ your laborers, convert your idle lands into profitable farms, build up comfortable homes, and make handsome contributions to the revenue of your State. A few dollars appropriated now to aid them in coming together for conference, to consider their necessities, to guard against mistakes, and encourage advancement, would certainly prove

a profitable investment and meet with the hearty approval of those who appreciate the great possibilities and care for the full development of Missouri.

AGRICULTURAL SURVEY.

If it is expected to give satisfactory answers to those seeking information with a view of making homes in our State and aid in developing our resources, an agricultural survey of the State should be made at the earliest practical moment.

Prof. Swallow, in report of State University for 1871, calls attention to the necessity for this work, and briefly reviews and classifies our soils, and in some instances locates them. But the work should be extended so as to embrace each county in the State, and more fully answer all questions in relation to agriculture than was possible in the space allotted in the University catalogue.

Prof. Swallow says: "In the statistics of the State the soils must stand in the first rank, since they are the great source of national prosperity and power, and the basis of individual wealth and happiness."

Inquiries as to the soil, underlying formations, agricultural productions and the amount of rainfall, temperature and topography of the different sections and counties of the State are received at this office from every quarter of the globe, and should be met with prompt and authentic replies. No other state, possibly no other section containing 40,000,000 acres, has within its limits so many of the conditions necessary to the comfortable support of man. With a climate in the southern portion where cold is almost unknown, to the delightful, frosty, but short winters of the northern portions, an abundance of precipitation distributed throughout the entire season, with a variety of soils that will grow anything that may be produced in the temperate regions, including cotton, tobacco, wheat and corn—the four great agricultural staples of the world—we have much that would be brought out by an agricultural survey that would be of value to the State, information to the world, and of which Missourians might be proud.

The work should give the topography of each county, a statement of our soils and their location and the area covered by each, their adaptation to the staple crops, and their productive capacity.

SURPLUS AGRICULTURAL COMMODITIES.

A feature of the annual report for 1893 that was received with favorable comment, and seems to be appreciated by the general public, is the statement of the agricultural shipments from the State, compiled by counties. This indicates to those who desire the information what

each county is doing, what are its principal productions in each department of agriculture, the value of its timber for commercial purposes, and the minerals that are developed and the value of the output. If it is deemed wise to continue the collection of this information, it could be done with economy, and would be more authentic if the transportation companies doing business in the State were required to return this data upon a date fixed by law, and that it be uniform in character.

These transportation companies have evinced a deep interest in the development of our agricultural industries, have cheerfully furnished the information called for and given us such assistance as was possible under the circumstances. But, there being no provision of law requiring the reports, and the companies having made no preparation for it, some were able to report promptly, and others not for several months. Some were able to report to us only their car-load shipments, leaving unaccounted for large amounts of farm, dairy and poultry products shipped in quantities smaller than car-loads. Other companies reported all shipments by the pound, and others by the ton, leaving us to estimate the number of live-stock, dozens of eggs, crates of berries, etc.

The promptness and willingness with which these companies responded to requests from this office, as best they could under the circumstances, and the great value of increased agricultural production to the profitable operation of their lines, would probably indicate their indorsement of a law regulating these reports, fixing a date for returns and providing for uniformity in character.

DEPARTMENT OF IMMIGRATION.

In view of the fact that inquiries are received at this office from almost an unlimited number of people who desire to become citizens of this State and are seeking information as to our soils, climate and rainfall, and the industries and development of the State, could not a department of immigration be profitably provided for in connection with this Board? Your publications are largely sought after for information in this direction. Much data that is of value to the immigrants is now collected here, and the additional information could be gathered with but little cost. Such a department could be conducted in connection with the work of this office much more economically than elsewhere. If the estimated amount needed for clerical work is appropriated, and an allowance of probably $1500 per annum for printing and distributing bulletins and maps, much valuable work might be done in the interest of immigration.

With more than a million acres of agricultural college land and government land in South Missouri, and as much more that is uncultivated in the hands of private owners, with large farms all over the State that could advantageously be divided into smaller and more profitable farms, the matter should have such attention and should receive such action as would inform those seeking homes of the advantages and opportunities of our state.

AGRICULTURAL EDUCATION.

Congress of the United States, appreciating the necessity of an agricultural education, and liberal in its treatment of an industry that contributes so largely to the support of our institutions, and one whose success or decline is readily felt in every department of our State and National government, and upon whose growth or development depends the prosperity, possibly the existence, of one of the most progressive and advanced nationalities amongst the peoples of the earth, has wisely established agricultural colleges in the several states of the Union.

However valuable these colleges may be, it is a fact that they do not, or could not be expected to, reach the great masses of farmers' sons, whose labor can not be well dispensed with on the farm, and whose income is insufficient to pay board and other expenses from home. These boys, growing into manhood, upon whose energy, industry and judgment depends in a great measure the success of agriculture in your state—boys who should profitably cultivate your fields and orchards, grow and feed your live-stock in competition with intelligent breeders of the world—are not receiving the instruction and preparation for their calling that would be suggested upon careful consideration of the subject, or that the value and importance of this industry demands.

It appears to me that a great State like yours, ranking among the commonwealths of the Union as a leader in educational matters, might with profit provide for teaching the elements of agriculture in common schools. In time this would result in giving to the agriculturist the rudiments of an agricultural education, direct him to its advantages, and encourage him to continue in search of such information as would make him master of his vocation, and enable him to handle his fields and orchards and herds with profit to himself, and so as not to feel oppressively the contribution levied upon him in the interest of his state and her institutions.

CLERICAL ASSISTANCE.

If your Secretary is held responsible for the work in his office, for the economical and judicious expenditure of his funds, for the care and preservation of your vouchers and records, for the careful tabulation and editing of your crop reports, monthly bulletins and annual reports, then that provision of the law enacted by the 37th General Assembly, providing for the election of an assistant secretary by the Board, should be repealed, and the Secretary authorized to select such assistants as will be qualified for the work to be done, and as will faithfully and conscientiously endeavor to perform the duties assigned them.

Any provision of the law that would demand responsibility of one for work done by others, named without his advice or consent, and who feel in no way responsible to him for their selection or continuance in office, is evidently so unjust that it could not have been advised or approved by you, and certainly will not meet with your indorsement or support.

In every well-regulated private office, positions should be held only upon merit and competency, and in honest endeavor do the work assigned them and in the manner directed; and discipline can only be maintained and efficiency and faithfulness secured where there is authority for prompt discharge upon failure or neglect of duty.

These suggestions are made that you may take such action as would secure the most perfect harmony and avoid conflicts and dissensions that would be unpleasant to the clerical force and disagreeable to you.

The appropriation for clerical assistance should be increased to at least $1500 per annum, and will then be far below the amounts used by other states in their departments of agriculture, notwithstanding the fact that your Board has charge of much work they have not undertaken. While the clerical force remains what it has been for several years, the work has been materially increased and extended.

The State Weather Service has grown until more assistance is an absolute necessity, and under present conditions we are unable to supply it. The collection and compilation of agricultural shipments made by transportation companies of the State, never undertaken by this department until last year, requires a great deal of labor and should be provided for in making appropriations for clerical assistance.

When preparing matter for annual report, additional help should be employed, that the manuscript may be given to the printer with more promptness and the public supplied with reports at an earlier date.

AGRICULTURAL EXPERIMENT STATION

Of this state, organized under the "Hatch bill" and the grants and provisions of Congress, officially assented to by Governor Morehouse, was intended, as stated in the first section of the bill, to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science.

The bill is so framed as to embrace every department of agriculture and provide for investigations into every subject connected therewith. The judicious mating of improved animals, problems of economical feeding and the care of stock; the dairy, with the care of its herds and the profitable management of its products; conserving, cultivating and fertilizing the soils; rotation of crops, the proper management of commercial orchards, and the unsettled questions in horticulture, are problems, the solution of which is awaited with anxiety by the intelligent agriculturist of this state. Would it not be wise, if it is practical to do so, to place this department of the Agricultural college, a department whose sole purpose is to make experiments in the interest of agriculture, and to investigate questions suggested by them, under the control of the State Board of Agriculture?

This Board, composed of practical farmers, men who are every day brought in direct contact with features whose profit or advisability has not been definitely settled, men who for a lifetime have considered agriculture and its diversity of interests and know the problems solved and those awaiting further experiment, whose farms have been experimental grounds in a limited way, who appreciate the necessity for prompt, efficient, thorough and authentic work in this direction—are certainly qualified and equipped to take charge of this work and conduct it in lines profitable to the agriculturists of the State.

It is probable that this transfer of the Experiment station to the Board of Agriculture would be approved by the present management. At least one member of the Board of Curators has declared its advisability, and his belief that it would be advantageous to the Agricultural college.

The Dean of the Agricultural college and Director of the Experiment station is an *ex officio* member of this Board, and, under the provision of the law requiring you to examine into and report upon affairs of this institution, is a party to an investigation of a management for which he is solely responsible. This feature in the organization of your Board is not in accord with business methods, and might in some

instances be used to defeat a thorough investigation, or in withholding the full and fearless report you would be expected to make.

FRAUDULENT ARTICLES OF FOOD.

A decision of the Supreme Court recently submitted by Justice Harlan, affirms in the broadest terms the power of state governments to protect their citizens against imitations or fraudulent articles of food. Judge Harlan says: "The constitution of the United States does not secure to anyone the privilege of defrauding the public. Such deception is an offense against society, and the states are as competent to protect their people against such offenses or wrongs as they are to protect them against crimes or wrongs of a more serious character."

Deceitful imitations of lard, butter and apple vinegar, so manufactured and colored as to imitate the genuine article and defraud the consumer, are sold in large quantities in this State. It is asserted that at least 60 per cent of the prepared foods offered for sale are adulterated, and in many cases injurious. But it is unnecessary to consider the qualities of these compounds, but rather to insist that the consumer should be advised of the real character of the food offered him, and that any fraudulent imitation of a genuine article of food be punishable under your laws.

Every good citizen, no doubt, feels an interest in the enactment of such legislation as will protect the health and safety of the people, but n this matter you, being representative agriculturists and having to a certain extent the care of the agricultural industries of the State, have a special interest. Many of these fraudulent or deceitful imitations of articles of food are placed upon the market in direct competition with genuine articles produced upon your farms. The counterfeiting is so perfectly done that only an expert or a chemist can detect the difference, and by selling at a price but a margin less than that for which a pure article can be produced, has a tendency to drive the products of your farms, orchards and dairies from the market, defrauding you of profitable remuneration and supplying your people with a food, the purity and digestibility of which they know nothing.

If your laws required all articles of food offered to consumers to be so branded or colored as to clearly indicate their character and composition, and also provided for analysis by State chemist at the expense of the State, where fraud was suspected, it would no doubt prove of immense value to the farmers, and would be a long stride in the interest of pure food and better sanitation.

FINANCIAL STATEMENT.

I herewith submit the financial statement showing receipts and disbursements for 1894, and the balances that should be in the hands of the Treasurer on the 1st day of January, 1895:

Date.	Name.	Dr.	Cr.
	Distribution of Annual Report.		
1894.			
Jan. 1	By over-draft		60
8	To balance in old fund	$61 39	
8	By Rippey, frt. on rpts		$1 82
15	To requisition	100 00	
Feb 7	By Rippey, distributing 25th rep		22 75
Mch. 7	Grimshaw, express		144 55
7	Tribune Co		3 50
7	Church, freights		26 59
7	To requisition	100 00	
April 4	To requisition	50 00	
June 26	By Ballinger, salary		3 42
Nov. 30	To requisition	93 69	
Dec. 5	By Grimshaw, express		148 90
5	Wallau, boxes		47 60
5	Rippey, distributing 26th rep		5 35
		405 08	405 08
	Secretary's Salary Fund.		
1894.			
Jan. 1	To balance in state treasury	1,200 00	
Feb. 1	By Rippey		100 00
Mch. 1	Rippey		100 00
April 1	Rippey		100 00
30	Rippey		100 00
May 31	Rippey		100 00
June 30	Rippey		100 00
July 31	Rippey		100 00
Aug. 31	Rippey		100 00
Sept. 30	Rippey		100 00
Oct. 31	Rippey		100 00
Nov. 30	Rippey		100 00
Dec. 31	Rippey		100 00
		1,200 00	1,200 00
	Assistant Secretary's Salary Fund.		
1894.			
Jan. 1	To balance in state treasury	687 50	
Feb. 1	By Crume		50 00
Mch. 1	Crume		50 00
April 1	Crume		50 00
30	Crume		50 00
May 31	Crume		50 00
June 30	Crume		50 00
July 31	Crume		50 00
Aug. 31	Crume		50 00
Sep. 30	Crume		50 00
Oct 30	Crume		50 00
Nov. 30	Crume		50 00
Dec. 31	Crume		50 00
		687 50	600 00
	By balance in State treasury		87 50
		687 50	687 50

FINANCIAL STATEMENT—Continued.

Date.	Name.	Dr.	Cr.
	Veterinary Service Fund.		
1894.			
Jan. 1	To balance in hands of our treasurer	$700 55	
8	By expense of members		$12 50
8	Maud Rippey, stenographer		40 00
8	White		155 70
8	Meyer		40 50
8	Adair		38 88
8	O'Brien		13 30
8	Brownlee		4 00
8	Rouif		44 25
8	Turner		225 03
8	Anderson		3 50
8	Guitar		2 50
8	Ammerman		3 65
8	Paquin		7 91
15	To requisition	500 00	
Feb. 7	By Guitar		2 50
7	Turner		291 88
7	Meyer		14 25
7	Maud Rippey, stenographer		40 00
7	Stephens		19 00
7	Carter & Co		3 25
7	To requisition	300 00	
Mch. 7	By Turner		266 53
7	J. S. Meyer		36 25
7	Adair		23 20
7	Maud Rippey, stenographer		40 00
7	Ammerman		5 40
7	Maitland		14 00
7	A. W. Meyer		15 70
7	Luthy		31 00
7	Ely		12 00
7	Groves		10 70
7	Wilkinson		24 00
7	Stone		8 00
8	To requisition	600 00	
April 4	By Turner		289 15
4	White		78 25
4	Meyer		51 75
4	Maud Rippey, stenographer		40 00
4	Saunders		7 50
4	Rouif		75 75
4	Ammerman		2 91
4	To requisition	600 00	
May 2	By Wyckoff, Seamans & B		2 00
2	Turner		301 68
2	White		42 35
2	Meyer		92 00
2	By Boughner		102 60
2	Maud Rippey, stenographer		40 00
2	To requisition	500 00	
2	By Rouif		47 75
June 6	Turner		305 13
6	White		23 35
6	Adair		12 80
6	Meyer		105 25
6	Rouif		39 00
6	Boughner		103 30
6	Maud Rippey, stenographer		40 00
13	To requisition	800 00	
26	By Ballinger		51 37
26	Turner		208 33
26	Boughner		100 00

FINANCIAL STATEMENT—Continued.

Date.	Name.	Dr.	Cr.
1894			
June 26.....	By Maud Rippey, stenographer.....	.....	$40 00
26.....	Ammerman.....	.....	2 54
27.....	To requisition.....	$600 00	
Aug. 1.....	By Turner.....	.....	387 48
1.....	Meyer.....	.....	129 00
1.....	White.....	.....	93 55
1.....	Adair.....	.....	25 80
1.....	O'Brien.....	.....	21 60
1.....	Rouif.....	.....	4 00
1.....	Robards.....	.....	38 75
1.....	Boughner.....	.....	106 65
1.....	Maud Rippey, stenographer.....	.....	40 00
1.....	Stephens.....	.....	10 00
1.....	Moss.....	.....	16 50
1.....	Hall & Glenn.....	.....	4 50
1.....	Ammerman.....	.....	45
1.....	Clark.....	.....	20
1.....	Carter & Co.....	.....	6 75
1.....	To requisition.....	600 00	
Sept. 5.....	By Turner.....	.....	274 78
5.....	Rouif.....	.....	87 15
5.....	Meyer.....	.....	28 25
5.....	Adair.....	.....	10 00
5.....	Robards.....	.....	11 05
5.....	Boughner.....	.....	104 95
5.....	Maud Rippey, stenographer.....	.....	40 00
5.....	Carter & Co.....	.....	10 80
5.....	Ammerman.....	.....	1 55
5.....	To requisition.....	600 00	
Dec. 5.....	By Maud Rippey, September salary.....	.....	40 00
5.....	Maud Rippey, October salary.....	.....	40 00
5.....	Maud Rippey, November salary.....	.....	40 00
5.....	Ammerman.....	.....	2 26
5.....	Turner.....	.....	834 67
5.....	Boughner.....	.....	311 60
5.....	White.....	.....	172 85
5.....	Meyer.....	.....	60 15
5.....	Adair.....	.....	57 87
5.....	Rouif.....	.....	134 95
5.....	Nixon.....	.....	19 50
5.....	May.....	.....	7 00
5.....	Carter & Co.....	.....	3 00
5.....	Ammerman.....	.....	2 10
7.....	To requisition.....	2,170 70	
15.....	To Wyckoff, S. & B.....	2 00	
1895.			
Jan. 1.....	By balance.....	.....	1,139 76
		7,973 25	7,973 25
	Expense of Members Fund.		
1894.			
Jan. 1.....	To balance in hands of our treasurer.....	331 83	
8.....	By Estill, col. com. meeting.....	.....	10 50
8.....	Ely, col. com. meeting.....	.....	10 50
8.....	Wilkinson, reorganization.....	.....	23 50
8.....	Ely, annual meeting.....	.....	14 10
8.....	Ireland.....	.....	15 00
8.....	Rhoades.....	.....	25 00
8.....	Maitland.....	.....	15 00
8.....	Groves.....	.....	20 00
8.....	Potts.....	.....	4 90
8.....	Meyer.....	.....	22 20
8.....	Cook.....	.....	26 70
8.....	Wilkinson, col. com. meeting.....	.....	25 20

FINANCIAL STATEMENT—Continued.

Date.	Name.	Dr.	Cr.
1894			
Jan. 8.....	By Wilkinson, annual meeting	.....	$26 00
8.....	Stone.....	.....	8 30
Feb. 8.....	By error in requisition, entry of Dec. 6, 1893.....	.....	53 13
7.....	Maitland.....	.....	12 00
7.....	Estill.....	.....	8 20
7.....	To requisition.....	$75 00	
April 4.....	By Estill.....	.....	6 70
May 2.....	Rippey.....	.....	1 80
June 6.....	Groves.....	.....	9 70
6.....	Wilkinson.....	.....	26 00
6.....	Ireland.....	.....	14 50
6.....	Stone.....	.....	10 00
6.....	Estill.....	.....	6 20
6.....	Maitland.....	.....	14 50
6.....	Potts.....	.....	4 60
13.....	To requisition.....	100 00	
26.....	By Ballinger.....	.....	4 12
26.....	Guitar.....	.....	3 00
Aug. 1.....	Estill.....	.....	9 85
Sept. 5.....	Maitland.....	.....	14 00
5.....	Ely.....	.....	11 50
Dec. 7.....	J. A. Potts.....	.....	5 80
7.....	Maitland.....	.....	14 00
7.....	To requisition.....	210 13	
1895.			
Jan. 1.....	By balance.....	.....	243 46
		716 96	716 96
	Farmers' Institute Fund.		
1894.			
Jan. 1.....	To balance in hands of our treasurer.....	849 95	
8.....	By Waters.....	.....	133 35
8.....	Postage.....	.....	40 00
8.....	Meyer.....	.....	3 65
8.....	Groves.....	.....	2 50
8.....	Ely.....	.....	12 00
Feb. 7.....	By postage	.....	42 30
Mar. 7.....	Postage	.....	100 00
7.....	Ammerman.....	.....	16 22
April 4.....	Ammerman	.....	7 06
4.....	Stephens	.....	10 00
4.....	Carter.....	.....	4 00
4.....	Postage.....	.....	15 00
May 2.....	Postage	.....	20 00
2.....	Ammerman	.....	6 54
June 26.....	Ballinger	.....	27 40
26.....	Tribune Co	.....	35 75
26.....	Phillips	.....	14 00
26.....	Ammerman.....	.....	5 74
26.....	Postage.....	.....	20 00
Aug. 1.....	Stephens	.....	1 00
1.....	Missouri Pacific Railroad Co	.....	90
1.....	Postage	.....	40 00
1.....	Rippey, Exp. to St. Louis	.....	5 00
1.....	Ammerman.....	.....	2 20
Sept. 5.....	Carter & Co.	.....	29 25
5.....	Bouchelle, P. M.....	.....	38 10
5.....	Morgan Envelope Co.....	.....	13 00
5.....	To requisition.....	4,985 02	
Dec. 5.....	By Abbott.....	.....	246 60
5.....	Waters	.....	345 05
5.....	Terry.....	.....	425 16

FINANCIAL STATEMENT—Continued.

Date.	Name.	Dr.	Cr.
1894			
Dec. 5.....	By Rippey	.....	$169 62
5.....	Patterson.....	.....	207 70
5.....	Whitney.....	.....	209 65
5.....	Ramsay.....	.....	368 50
5.....	Sec'y paid Ins. force, etc.....	.....	171 89
5.....	Chubbuck, Clint H.....	.....	144 80
5.....	Russell.....	.....	2 00
5.....	Rhoades.....	.....	7 10
5.....	Bal. exp. on dist. rpts	.....	8 15
5.....	Randolph, frt. bills.....	.....	1 96
5.....	Behring.....	.....	5 80
5.....	Ammerman.....	.....	12 04
5.....	Chubbuck, Levi.....	.....	40 41
5.....	State Dairy Association.....	.....	100 00
5.....	Stephens	.....	10 00
5.....	C. D. Colman.....	.....	66 75
5.....	" "	.....	7 50
5.....	Journal of Agr. Co	.....	41 20
5.....	" "	.....	2 00
5.....	Lon Hardman & Co.....	.....	3 00
5.....	Midland Poultry Journal	.....	6 00
5.....	National Dairyman Co.....	.....	2 00
5.....	Church	.....	68 25
5.....	Ammerman.....	.....	10 25
5.....	Poultry Ass'n.....	.....	100 00
5.....	Good Roads Ass'n.....	.....	100 00
5.....	Live Stock Indicator	.....	5 25
5.....	Swine Breeders.....	.....	50 00
1895.			
Jan. 1.....	Balance.....	.....	2,251 38
		$5,834 97	5,834 97
	Monthly Crop Report Fund.		
1894			
Jan. 1.....	To balance in the hands of our Treasurer..	100 65	
8.....	By postage	.....	20 00
Feb. 7.....	Stephens.....	.....	12 50
7.....	postage.....	.....	42 30
7.....	"	.....	35 00
7.	To requisition.....	100 00	
Mch. 7.....	By Stephens.....	.....	127 60
7.....	To requisition	150 00	
Apr. 4.....	By postage	.....	35 00
4.....	To requisition	100 00	
May 2.....	By Stephens.....	.....	46 55
2.....	postage.....	.....	20 00
June 6.....	Colman.....	.....	3 00
6.....	Stephens	.....	33 90
6.....	postage.....	.....	40 00
13.....	To requisition	100 00	
26.....	By Ballinger.....	.....	6 85
26.....	postage.....	.....	20 00
26.....	Stephens	.....	51 50
July 1.	To requisition	100 00	
Aug. 1.....	By Stephens.....	.....	105 60
1.....	To requisition	100 00	
Sept. 5.....	By Stephens	.....	53 30
Dec. 5.....	postage, October	.....	47 30
5.....	" for November.....	.....	20 63
5.	" for balance of September.	.....	14 75
5.....	" December.....	.....	40 00

FINANCIAL STATEMENT—Continued.

Date.	Name.	Dr.	Cr.
1894			
5.....	By Dist. postage	.....	$40 00
5.....	Stephens.....	.....	16 00
7.....	To requisition	$250 00	
1895			
Jan. 1.....	By balance.....	....	168 87
		1.000 65	1,000 65
	State Weather Service Fund.		
1894.			
Jan. 1.....	To balance in our Treasurer's hands.....	104 95	
8.....	By Stephens	.....	25 00
8.....	Schneider Bros	.....	70 10
8.....	Ammerman.....	.....	2 90
8.....	Schweisch.....	....	75
8.....	Queen & Co., old bill.....	.....	10 00
15.....	To requisition.	50 00	
Feb. 6.....	To excess allowed on requisitions dated August, 1893, and September, 1893.	94 08	
7.....	By Stephens.....	.....	30 95
Mch. 7.....	Stephens	.....	25 00
7.....	Hobbs.	.....	24 00
Apr. 4.....	Stephens	.....	25 00
10.....	To requisition	100 00	
May 2.	By Stephens	.. ..	26 00
2.....	Clark	.....	90
June 2.....	Stephens	.....	25 00
26.....	Ballinger	.....	3 42
26.....	Clark	.....	40
26.....	Stephens.....	.....	25 75
June 26	To requisition.....	100 00	
Aug. 1.....	By Stephens	.....	25 00
Sept. 5.....	Stephens	.....	25 00
Dec. 5.....	Stephens	.....	75 00
5.....	Gaslight and Coke Co.....	.....	1 40
5.....	Ammerman.....	....	60
7.....	To requisition	140 72	
1895			
Jan. 1.....	By balance	.....	167 58
		589 75	589 75
	Office Expense Fund.		
1894			
Jan. 1.....	To balance in the hands of our Treasurer...	50 00	
8.....	By Baird	.....	2 50
8.....	Carter	.....	3 88
8.....	Hobbs, salary.....	.....	26 00
8.....	Stephens	.....	6 00
8.....	Ammerman.....	.....	1 89
8.....	Hobbs, expense incurred	....	1 10
8.....	To requisition	50 00	
Feb. 7.....	By Hobbs, salary.....	.....	27 00
7.....	Carter & Co	.....	23 65
7.....	Burroughs & Vivion Bros	.....	4 95
7.....	Rippey	.....	1 45
7.....	Stephens	.....	5 50
7.....	To requisition	75 00	
Mch. 7.....	By Statesman	.....	6 00
7.....	Thomas	.....	3 00
7.....	Rippey, incidentals	.....	1 40
April 4.....	Hobbs.....	.....	27 75
4.....	Clark	....	1 30
10.	To requisition.....	50 00	
May 2... ...	By John Hobbs.....	.....	26 70
2.....	Mathews	.....	2 15

FINANCIAL STATEMENT—Continued.

Date.	Name.	Dr.	Cr.
1894			
June 6.....	By Hobbs	.....	$29 35
6.....	Carter	.....	7 50
6.....	Lyons Bros	.....	1 10
13.....	To requisition	$100 00	
26.....	By Ballinger.....	.....	3 42
26.....	Hobbs	.....	26 50
26.....	Rippey	.....	1 00
Aug. 1.....	Hobbs	.....	28 00
Sept 5.....	Hobbs	.....	29 45
5.....	Ammerman	.....	2 25
5.....	To requisition	50 00	
Dec. 5.....	By Hobbs	.....	25 00
5.....	Hobbs	.....	27 00
5.....	Hobbs	.....	28 25
5.....	Carter & Co.....	.....	11 95
5.....	Stewart & Co.....	.....	50
7.....	To requisition.....	139 05	
1895			
Jan. 1.....	By balance	.....	120 56
		514 05	514 05

After a careful consideration of the necessities of this department, I herewith submit an estimate of appropriations required for support of various funds for the biennial period of 1895 and 1896:

Veterinary service.....	$17,000	Weather service	$2,000
Farmers' institutes.....	8,000	Distribution reports	1,000
Crop reports.....	2,000	Clerical assistance.....	4,000
Office expenses.....	2,000	Treasurer's salary.....	200
Expense of members	2,000		

The Board, after examination of the needs of each fund, indorse the above estimate, and recommend that the sums named be appropriated.

J. L. Ballinger, Treasurer, in account with State Board of Agriculture.

Distributing Annual Report.

1894				
Jan. 1..	To balance on hand..	$61 39	Amount paid out as per war-	
25..	received.....	100 00	rants returned to Secretary.	$405 06
May 22..	"	100 00		
April 18..	"	50 00		
Dec. 10..	"	93 67		
		405 06		405 06

Veterinary Service.

1894				
Jan. 1..	To balance on hand.	$700 55	Amount paid out and warrants returned to Secretary	$6831 85
23..	received.....	500 00	Balance on hand.....	1139 40
Feb. 15..	"	300 00		
Mch. 22..	"	600 00		
April 18..	"	600 00		
May 11..	"	500 00		
June 22..	"	800 00		
July 7..	"	600 00		
Aug. 14..	"	600 00		
Sept. 21..	"	600 00		
Dec. 17..	"	2170 70		
		7971 25		7971 25

Weather Service.

1894				
Jan.	To balance.....	$199 06	Amount paid and warrants returned to Secretary	$422 17
23..	received.....	50 00	Balance on hand	167 61
Apr. 18..	"	100 00		
July 7..	"	100 00		
Dec. 17..	"	140 72		
		589 78		589 78

Monthly Crop Report.

1894				
Jan. 1..	To balance.....	$100 65	Amount paid and warrants returned	$831 78
Feb. 15..	received.....	100 00	Balance	168 87
Mch. 22..	"	150 00		
Apr. 18..	"	100 00		
June 21..	"	100 00		
July 7..	"	100 00		
Aug. 14..	"	100 00		
Feb. 17..	"	250 00		
		1,000 65		1,000 65

Office Expenses.

1894				
Jan. 1..	To balance.....	$50 00	Amount paid and warrants returned	$393 49
23.	received.....	50 00	Balance	120 56
Feb. 15..	"	75 00		
Apr. 18..	"	50 00		
June 21..	"	100 00		
Sept. 15..	"	50 00		
Dec. 17..	"	139 05		
		514 05		514 05

Expenses of Members.

1894				
Jan. 1..	To balance.....	$300 00	Amount paid and warrants returned	$441 67
Feb.	requisition.....	75 00	Balance	243 46
June 21..	"	100 00		
Dec. 17..	"	210 13		
		685 13		685 13

Farmer's Institutes.

1894				
Jan. 1..	To balance on hand.	$800 10	Amount paid and warrants returned	$3,567 16
Sept. 14..	rec'd of State Tr.	4,985 02	Balance	2,251 58
Dec. 25..	rec'd of Secretary.	33 62		
		5,818 74		5,818 74

The Board having under consideration the question of co-operation with the State Board of Health in the extirpation of contagious and infectious diseases as a sanitary measure, the following motion, offered by Gov. Stone, was adopted:

It shall be the duty of the State veterinarian to aid the State Board of Health in such investigations as they may deem advisable, when so instructed by the State Board of Agriculture.

The following officers were elected for the ensuing year:

Alex. Maitland, President.
D. A. Ely, Vice-President.
J. R. Rippey, Secretary.
Snowdie B. Willis, Assistant Secretary.
H. H. Banks, Treasurer.

EXECUTIVE COMMITTEE.

J. A. Potts, D. A. Ely, Wallace Estill, Alex. Maitland, Paul Schweitzer.

The following resolution, offered by Prof. Wolfe, was unanimously adopted, and the Secretary instructed to furnish the family of deceased and the papers of the city with a copy:

Resolved, That in the recent death of Dr. Edward D. Porter, for a number of years Dean of the College of Agriculture and Mechanic Arts and *ex officio* member of this Board, the Board has lost an able and beloved member, the cause of industrial education a distinguished and devoted champion, and the community an honored citizen.

Resolved, further, That the members of the State Board of Agriculture hereby express their high appreciation of the able services of the lamented Dean, and extend their sincere sympathy to the bereaved family.

The following resolution offered by Gov. Stone was adopted:

Resolved, That Hon. J. A. Potts, a member of this Board, having been honored with the presidency of the National Live-Stock Sanitary convention, is

hereby requested to attend the meeting of said Association to be convened in Chicago in 1895.

On motion of J. A. Potts, the Secretary was instructed to write up the work of the Board, its meetings and reports of committees and such suggestions as the Board may now make, calling attention to the report of the Secretary, and respectfully ask the consideration of the 38th General Assembly to the recommendations therein contained—said report to be submitted to the Governor for his approval.

On motion of Gov. Stone, the Treasurer was required to report to the Auditing committee the amount on hand Jan. 1, 1894, amounts received and disbursed during the year, and balance on hand Jan. 1, 1895.

Adjourned to meet at office of Secretary at 8 o'clock a. m. on the 9th.

COLUMBIA, Mo., Jan. 9, 1895.

Board met in pursuance of adjournment. Members present, Gov. Wm. J. Stone, Prof. L. E. Wolfe, Dr. Paul Schweitzer, Alex Maitland, D. A. Ely, Eugene Rhoades, J. F. Groves, L. F. Luthy, J. A. Potts, W. R. Wilkinson and F. E. Bybee.

On motion, the President was instructed to appoint the Auditing committee for 1896, a few days before annual meeting.

The Auditing committee, consisting of Senator F. E. Bybee, L. F. Luthy and Eugene Rhoades, submitted the following report, which was received and the committee discharged:

To the State Board of Agriculture:

We, the Auditing committee, respectfully report that we, after carefully examining the reports, find that the Secretary and Treasurer have their books, as to results, correct. We suggest that they be required hereafter to keep their books separate and make their reports individually, and sign them officially.

We further suggest that the Secretary be instructed to open and keep a secretary's account.

We find in the hands of the Treasurer, January 1, 1895, as follows:

Veterinary service	$1,139 42
State weather service	167 58
Monthly crop reports	168 87
Office expenses	120 56
Expense of members	240 49
Farmers' institutes	2,251 38

Respectfully submitted.

F. E. BYBEE,
L. F. LUTHY,
EUGENE RHOADES.

On motion, the President appointed Senator F. E. Bybee as a representative of this Board at the convention of Industrial Associations to meet in Jefferson City on the 10th inst.

The following resolution, offered by Dr. Schweitzer, was adopted:

Resolved, That we recognize the honest efforts of the University authorities to render the Agricultural college and Experiment station more efficient than it has been heretofore, and that, to aid the Board of Curators in carrying out such plans as will bring the boys and girls from the farm to the college for a useful and technical education, the Board appoint a committee of three to consider, in conjunction with the Governor, and submit such specific recommendations as will enable the Board of Curators to properly carry out such plans during the coming year.

The Agricultural College committee, Groves, Ely and Potts, with the addition of Dr. Schweitzer and the Governor, were appointed on said committee.

AGRICULTURAL COLLEGE COMMITTEE.

Committee consisting of J. F. Groves, J. A. Potts and D. A. Ely, named by President Estill to examine into the affairs of the College of Agriculture and Mechanic Arts and Experiment station, met at the office of Secretary January 3, 1895, and after a session of two days, during which time they conferred with parties connected with these institutions, adjourned to meet with the general Board to be convened on January 8. Here all matters in relation to these institutions were fully discussed, and further adjournment was taken for conference with executive board of the Board of Curators, to meet at the office of the Proctor of the University at a date to be fixed, in the latter part of January.

COLUMBIA, MO., February 2, 1895.

The following members of the State Board of Agriculture—Alex. Maitland, D. A. Ely, Gov. Wm. J. Stone and Dr. Paul Schweitzer—met to confer with Executive Committee of Board of Curators in regard to the Agricultural college and Experiment station, and the following plan of organization was advised, and the provisions were embodied into the following bill, and introduced into 38th General Assembly by Representative Bittinger. This bill, however, failed to become a law, and the management of the Experiment station remains under the exclusive charge of the Board of Curators.

AN ACT to secure a more efficient management of the Agricultural Experiment station and farm connected with the College of Agriculture and Mechanic Arts in the University of the State at Columbia, and to provide more fully for training and instruction in practical agriculture and its kindred industries.

Be it enacted by the General Assembly of the State of Missouri, as follows:

1. There is hereby established a Board of Managers of the Agricultural Experiment station and farm connected with the College of Agriculture and Mechanic Arts in the University of the State at Columbia, which shall consist of five members, three of whom shall be members of the State Board of Agriculture, and who shall be chosen and appointed by said last-mentioned Board, the other two of whom shall be members of the Board of Curators of the State University, and also shall be chosen and appointed by said last-mentioned Board; and the members so chosen and appointed as aforesaid shall hold their places at the will of the respective boards so choosing and appointing them.

2. Said Board is authorized and empowered to conduct and manage the affairs and duties and transactions appertaining to said Experiment station and farm, to direct the application and expenditure of the income belonging to them, as derived from the products of farm and garden, and from the acts of Congress of July 2, 1862, March 2, 1887, and August 30, 1890—due reference being had to the apportionment and distribution of the funds furnishing said income, as hereinafter provided.

3. Said Board of Managers shall appoint, subject to the approval of the Board of Curators of the University, the director of said Experiment station and farm.

4. The funds accruing to said Experiment station and farm and to the College of Agriculture and Mechanic Arts shall be annually ascertained and distributed in legal and fair proportion among the different departments and subdepartments of said College of Agriculture and Mechanic Arts, and said Experiment station connected therewith, by a committee consisting of the President of the University, the President of the State Board of Agriculture, the Dean of the College of Agriculture and Mechanic Arts, and the Secretary of the Board of Curators of the University.

5. In addition to the instruction now provided in the College of Agriculture and Mechanic Arts—viz., in physics, chemistry, mathematics, biology, drawing, manual training, scientific agriculture, English and other modern languages—there shall be added a course or courses of industrial training in practical agriculture, horticulture, dairying, stock-breeding, poultry-raising, and the kindred industries, and in order to accomodate the classes of students taking said course or courses with suitable rooms and conveniences for work and instruction in the course or courses aforesaid, the sum of $——— is hereby appropriated out of any money in the treasury not otherwise appropriated, for the erection and equipment of a building on the grounds of the horticultural department. Said building shall be erected according to the plans adopted by the said Board of Managers and approved by the Board of Curators of the University, and the money hereby appropriated shall be paid out only upon requisition by said Board of Curators upon the State Auditor, as required by section 5692 of the Revised Statutes of Missouri of 1889.

REPORT OF AGRICULTURAL COLLEGE COMMITTEE.

To Secretary: We, the committee appointed by the State Board of Agriculture to examine into the affairs of the College of Agriculture and Mechanic Arts and the Experiment station, beg to submit the following report of receipts and expenditures for 1894:

Statement of Income and Expenditures on account of A. and M. College (Land Grant) Fund for 1894.

1894.			
Jan. 1.....	To balance on hand.....	$1,293 73	
1.....	interest on endowment.....	7,925 00	
July 1.....	" "	7,925 00	
			$17,143 73
	Credits as follows:		
Jan. 8.....	By School of Mines.....	$1,981 25	
July 6.....	" "	1,981 25	
	By salaries paid professors during the year:		
	Paul Schweitzer.....	833 34	
	G. C. Broadhead.....	2,000 00	
	Geo. D. Purinton.....	1,333 34	
	W. J. Quick.....	2,000 00	
	J. P. Blanton.....	166 67	
	H. T. Corey.....	2,000 00	
	Fred Homberg.....	716 66	
	Silas Dinsmoor.....	900 00	
	M. H. Lockwood.....	250 00	
	L. W. Martin.....	400 00	
	A. C. Vandiver.....	166 66	
	E. A. Allen.....	2,291 67	
	Howard Ayers.....	961 15	
	H. B. Gibson.....	500 00	
	W. W. Griffith.....	200 00	
	W. B. Cauthorn.....	155 55	
	L. M. Defoe.....	250 00	
	G. A. Wauchope.....	200 00	
	H. C. Penn.....	200 00	
	Sidney Calvert.....	180 00	
	E. B. Cauthorn.....	133 33	
	Balance—overdraft.....	.....	2,657 14
		$19,800 87	$19,800 87

Statement of Income and Expenditures on account Morrill fund during year 1894.

1894				
Jan. 1.....	To balance on hand.....		$4,436 25	
Sept. 20.....	To sixth installment.....		18,915 97	
				$23,352 22
	Credits as follows:			
	1. School of Mines.....		$4,729 00	
	2. Mechanic Arts:			
	C. W. Marx, salary.....	$2,000 00		
	H. Van Blarcom, salary....	900 00		
	C. B. Rearick, salary.....	236 66		
	D. H. Holmes, salary.....	287 68		
	A. H. Place, salary.....	333 34		
			3,757 68	
	Equipment and supplies.....		256 67	
	3. English Language:			
	G. A Wauchope, salary....	$1,000 00		
	Calvin S. Brown, salary....	666 66		
	H. C. Penn, salary.....	200 00		
			1,866 66	
	4. Mathematical Science:			
	L. M. Defoe, salary.....	$1,116 66		
	N. C. Riggs, salary.....	430 00		
	Jean A. Shaefer, salary....	120 00		
	Ruby Westlake, salary.....	120 00		
	Geo. L. Brown, salary.....	120 00		
	Samuel A. Smoke, salary..	240 00		
	W. C. Lindall, salary.....	333 33		
	E. B. Cauthorn, salary.....	133 33		
			2,613 32	
	Equipment and supplies.....		66 45	
	5. Physical Science:			
	M. L. Lipscomb, salary....	$2,000 00		
	Wm. Shrader, salary.....	2,000 00		
			4,000 00	
	Equipment and supplies.....		247 13	
	6. Natural Science:			
	Equipment and supplies.....		949 13	
	7. Economic Science:			
	T. C. Hicks, salary.....	$2,000 00		
	M. S. King, salary.....	1,000 00		
	Isidor Loeb, salary.....	250 00		
	A. J. McCulloch, salary....	120 00		
	H. K. White, salary.....	60 00		
			3,430 00	
	Books of reference.....		32 00	
	Balance on hand.....		1,404 09	
			23,352 00	23,352 22

MISSOURI AGRICULTURAL EXPERIMENT STATION.

Detailed Statement of Receipts and Disbursements during the year ending June 30, 1894.

RECEIPTS.		
Cash balance on hand July 1, 1893	$152 39	
From U. S. Government appropriation	15,000 00	
From sales produce, stock, etc., Agricultural department	1,959 43	
From sales produce, stock, etc, Horticultural department	257 07	
		$17,368 89
DISBURSEMENTS.		
Salaries	$5,200 00	
Labor	5,366 08	
Supplies	2,447 77	
Implements and machinery	565 38	
Freight, express, drayage	216 42	
Advertising, stationery and postage	245 13	
Printing	1,107 40	
Library	13 00	
Fencing and drainage	524 22	
Furniture	130 35	
Repairs (to permanent improvements)	427 51	
Live-stock	254 50	
Traveling	246 45	
Incidental	28 00	16,772 21
Balance on hand July 1, 1894		596 68

DISBURSEMENTS IN DETAIL—BY DEPARTMENTS.

General or Miscellaneous.		
SALARIES.*		
Dr. E. D. Porter, Director	$1,875 00	
Irvin Switzler, Secretary	950 00	
		$2,825 00
LABOR		
Fanny Byers, cleaning office, privy, etc	$1 50	
Miss M. Estelle Porter, stenography and typewriting	104 85	
Henry Baker, cleaning rooms	2 85	
John Montgomery, wood sawyer	2 00	
Irvin Switzler, sec., errand boys, etc	75	
Chas. Matthews, cleaning and putting up stove	75	
John Crist, hauling and putting in safe	5 00	
		117 70
SUPPLIES.		
Columbia Gas Co	$22 20	
Blackfoot Coal Co	34 95	
	$57 15	$2,942 70

* Salary of Director, $2500, one-half paid by Agricultural College till Jan. 1, '94. Salary of Secretary was $900 until Jan. 1, '94, then increased to $1000.

DISBURSEMENTS IN DETAIL—BY DEPARTMENTS—Continued.

Hatton Bros., wood-box	25	
L. Frazee, wood	$3 00	
W. M. Scott, wood	6 00	
J. R. Marsh, wood	3 00	
I. Switzler, Sec., pins, flue-caps, brooms, etc	1 85	
Dr. E. D. Porter, Director, chinch-bug brush, twine, wadding, elastics	3 90	
Wyckoff, S. & B., typewriter paper, ribbons, etc	6 60	
Geo. F. Lasher, two postal guides	4 24	
Chas. Matthews, deed-box for papers	1 75	
Jno. Crist, seven packing boxes for bulletins	11 00	
		$98 74
FREIGHT, EXPRESS, DRAYAGE AND TELEGRAPH.		
Dr. E. D. Porter, vouchers 2102, 2137, 66, 106	$69 47	
I. Switzler, vouchers 2007, 2135, 10, 70	2 50	
E. W. Stephens, voucher 2133	5 20	
Dr. P. Schweitzer, voucher 14	2 70	
Wabash R. R., voucher 107	10 80	
Jno. Crist, voucher 125	4 00	
		94 67
ADVERTISING, STATIONERY AND POSTAGE.		
Dr. E. D. Porter, vouchers 1662, 1741, 2102, 2137, 66, 106, 152	$61 80	
I. Switzler, vouchers 1593, 1801, 1909, 2101, 2135, 10, 70	22 70	
E. W. Stephens, vouchers 1660, 2011, 2096, 94	24 55	
W. G. Barrett, vouchers 2136, 12, 62, 126	18 50	
Barnard & Co., voucher 15	10 75	
Wyckoff, S. & B., voucher 2129	1 68	
Burroughs & Vivion, voucher 122	2 45	
W. E. Harshe, voucher 2134	2 90	
Morgan Envelope Co., voucher 2130	55 80	
		201 13
PRINTING.		
E. W. Stephens, bulletins Nos. 19, 20, 22, 23—13,000 each	$1,082 40	
		1,082 40
FURNITURE.		
Chas. Matthews, vouchers 1805, 61	$4 85	
Branham, Mitchell & Robinson, voucher 63	25 50	
Alpine Safe Co., voucher 67	100 00	
		130 35
REPAIRS.		
John Crist, vouchers 1739, 1911, 11, 64	$53 20	
Jos. Gerig, vouchers 1738, 124	40 70	
Richard Knight, voucher 1697	9 00	
McAlester Lumber Co., voucher 1740	5 65	
J. F. Craigo, voucher 68	46 50	
Alex. Stewart, voucher 69	18 25	
		173 30
TRAVELING.		
Director attending annual meeting of American Association of Agricultural Colleges and Experiment Stations at Chicago, Ill. (voucher 1743)	25 00	
Members of station staff and faculty attending Farmers' institutes ($200 appropriated, $54.50 unexpended), voucher 1878	145 50	
Director visiting Lawrence, Kas., chinch-bug investigation, voucher 66	20 80	
		191 30

DISBURSEMENTS IN DETAIL—BY DEPARTMENTS—Continued.

INCIDENTALS.		
Membership fee 1892-3 American Association of Agricultural Colleges and Experiment Stations, voucher 1661	$10 00	
Membership fee 1893-4 American Association of Agricultural Colleges and Experiment Stations (voucher 2128)	15 00	
		$25 00
Total general or miscellaneous		4,939 59
Department of Agriculture.		
LABOR.		
C. M. Conner	500 80	
W. C. Vandiver	393 50	
P. C. Lillard	418 85	
J. M. Pyne	105 85	
R. S. Willis	105 85	
A. M. Soule	70 00	
Horace Williams	46 00	
Chas. Madison	213 60	
Miss M. E. Porter (stenography and typewriting)	38 55	
Matt. Marshall	320 38	
Henry Washington	278 50	
A. C. Vandiver (student labor)	110 35	
Wm. O'Bryan	354 45	
B. B. Billups	51 05	
Lon Lillard	48 50	
Eugene Williams	5 00	
Jacob Baker	1 00	
Aaron Edwards	1 00	
Thos. Vandiver	12	
Alex. Douglas	5 25	
Pomp Turner	23 00	
Jno. Pearson	3 00	
Alf. Simpson	6 00	
Robt. Vincil	1 00	
Robt. Bass	1 70	
Chas. Turner	2 00	
Ernest Doll	1 70	
Chas. Ellis	23 45	
Jas. Turner	40 70	
Pink Green	4 00	
P. Pratt	8 05	
Oll Kelly	6 50	
J. McQuitty	4 20	
C. O. Jenkins	1 90	
Oscar Branham	3 00	
Edgar Prewitt	87 00	
Wat Hurd	18 00	
Geo. Byard	60	
Jos. Goslin	11 65	
F. S. Spratt	13 30	
Wm. Moody	3 45	
Eugene Williams	8 40	
W. H. Bretz	36 00	
Jno. Walden	7 40	
Ev. Cawhorn	5 00	
Fred. Brown	21 80	
C. C. Marsh	31 22	
Randall Wright	57 80	
F Cauthorn	5 00	
E. C. Harrington	6 60	
Thos. Vanhorn	55	
Jas. Taylor	14 40	
F. Jacobs	8 80	

DISBURSEMENTS IN DETAIL—BY DEPARTMENTS—Continued.

Geo. Maxwell	$9 00	
Wm. Hardeman	7 40	
Wm. Vaughn	2 00	
Squire Roley	5 40	
Abe Harney	13 90	
Thos. Griffin	3 75	
Henry Leppert	5 00	
—— Denny	1 00	
G. W. Thomason	50	
J. Walters	4 50	
J. Harrison	2 70	
D. Green	2 55	
J. C. Booth	2 25	
Frank Jackson	1 50	
Sam J. Anderson	24 62	
Lon Buckner	24 75	
Jas. Harris	37 90	
Milton Kelly	33 75	
Wm. Douglas	8 50	
Ernest Smith	10 00	
Moses Harris	18 65	
Wm. Clark	16 00	
Jo Miller	21 25	
Jas. Freeman	8 75	
Geo. Butler	11 25	
Jno. Pearson	5 80	
J. P. Smith	50	
L. J. Wilson	1 50	
—— Steele	25	
—— Cruse	25	
Osborne Cook	17 25	
Jo Wright	14 25	
Harrison Claiborne	27 40	
Robt. Walden	3 75	
Chas. Cowden	4 75	
Alf. Kelly	8 60	
E. M. Kelly	4 00	
Ed. Coleman	2 50	
Geo. Daniels	2 25	
W. H. Roper	10 25	
C. F. Hart	5 00	
Lon Wright	5 50	
		$3,924 24

SUPPLIES.

Boone County Mill Co., feed	464 95	
Farmers' Mill Co., feed	213 15	
McAlester Lumber Co., miscl. lumber, lime, twine, etc	54 80	
Charles Matthews, hardware, tinware, etc	131 90	
C. C. Newman & Co., " "	11 50	
Hickam & Estes, " "	5 10	
Loeb & Son, salt, soap, seed, lye, etc	91 35	
W. M. Scott, feed, baskets, salt, etc	4 85	
Scott & Hubbell, seed potatoes	2 50	
Baker, Robinson & Co., seed potatoes, baskets, etc	24 80	
Nowell Grocery Co., grass seed	3 40	
Prather Bros., seed potatoes	9 45	
J. A. Adams, blacksmithing, etc	35 30	
R. H. Coombe, "	3 75	
G. L. Norvell, "	89 60	
Bell & Taylor, "	1 50	
J. J. Pauley, "	1 60	
Wm. A. Gill & Co., chinch-bug supplies	18 00	
B. F. Venable, machinery repairs and extras	2 50	
T. W. Conley, " " "	7 65	
Wm. Koenig & Co., " " "	12 64	
Fairbankks, Morse & Co., wind-mill "	1 05	

DISBURSEMENTS IN DETAIL—BY DEPARTMENTS—Continued.

A. T. Duncan, carpenter work	$12 30	
A. J. Root, apiary supplies	41 31	
Jos. W. Vestal, sweet potato, pepper and egg plants, etc	9 60	
——— Torbitt, fertilizer	30	
Beverly Chapman, repairing saws, etc	1 75	
E. F. Harmeyer, creamery	51 30	
Gas company, tar, lime, etc	8 80	
Whitelaw Bros., fertilizers	170 82	
A. B. Mayer, "	40 00	
B. M. Anderson, "	7 00	
J. G. Sexton, "	2 50	
A. M. Schweisch, "	2 00	
T. McBaine, seed corn	14 00	
F. Helms, "	1 40	
Hiram Howard, "	3 00	
H. P. Edmonds, "	2 55	
A. Nelson, "	1 70	
J. D. Ziller, "	1 50	
Wm. H. Maule, seed potatoes and corn	14 25	
J. V. Vissering, seed artichokes	2 75	
G. F. Rothwell, registering calf	2 00	
Plant Seed Co., miscellaneous seeds, &c	38 20	
J. C. Vaughan, " "	5 86	
Landreth & Sons, " "	1 58	
Jewell Nursery Co., nursery stock	21 70	
Pike Co. " " "	150 91	
Bush & Son & Meissner, " "	1 90	
Branham, Mitchell & Robinson, butter cloth, grain bags, etc	17 62	
Rives Pharmacy, drugs for stock	90	
Gilman & Dorsey, drugs, seeds, etc	15 30	
L. T. Henry, stock service	15 00	
F. Bihr, wagon and plow repairs	2 70	
R. B. Gordon, harness, repairs, etc	10 10	
F. B. Tumy, " "	12 40	
		$1,876 34
IMPLEMENTS AND MACHINERY.		
Whitener & Barnes, Dutton grinder	5 65	
Carpenter & Co., haycock covers	65 00	
N. D. Robnett, machine sections	17 20	
J. A. Adams, wagon, hay-frame, etc	67 15	
Chas. Matthews, scythes, forks, shovels, axes, picks, wheelbarrows, saws, galvanized buckets, hoes, pruning knives, etc	55 85	
G. L. Norvell, plows, machine sections	15 00	
Field Force Pump Co., pump fixtures	12 40	
McAlester Lumber Co., hay rake, Buckeye cultivator	43 50	
Cornish & Curtis, Babcock separator and fixtures	113 98	
Matthews & Boqua, heating boiler and fixtures, and creamery attachments, pipes, etc	36 50	
M. L. Edwards, stone work in dairy	6 00	
Hickam & Estes, shovels and forks	5 25	
		443 48
FREIGHT, EXPRESS, DRAYAGE AND TELEGRAPH.		
Dr. E. D. Porter, Director, vouchers 1594, 1790, 1866, 2033, 35, 151	79 81	
McAlester Lumber Co., voucher 1604	2 00	
Wabash R. R., voucher 1971	11 00	
		92 81
ADVERTISING, STATIONERY AND POSTAGE.		
Dr. E. D. Porter, Director, vouchers 1594, 1866, 2033, 35	17 10	
I. Switzler, Sec., voucher 1593	1 20	
E. W. Stephens, voucher 159	4 50	
Burroughs & Vivion, voucher 2088	8 50	
Geo. D. Barnard & Co., voucher 2091	4 00	
		35 30

DISBURSEMENTS IN DETAIL—BY DEPARTMENTS—Continued.

PRINTING.		
E. W. Stephens, voucher 159	$25 00	
		$25 00
FENCING AND DRAINAGE.		
J. R. Marsh, voucher 1603	82 00	
McAlester Lumber Co., vouchers 1870, 147	101 15	
Chas. Matthews, vouchers 2149, 81, 140	46 57	
Jno. Crist, voucher 98	19 34	
J. F. Craigo, voucher 145	39 90	
		288 96
REPAIRS.		
Fairbanks, Morse & Co., vouchers 1605, 2024	6 45	
W W. Hornberger, vouchers 1607, 2034, 139	16 45	
I. Switzler, Secretary, voucher 1593	1 50	
Matthews & Boqua, voucher 2023	6 25	
J. F. Craigo, voucher 145	5 00	
McAlester Lumber Co , vouchers 2086, 2151, 147	28 07	
Matthews & Walker, vouchers 33, 100	13 75	
Jno. Crist, vouchers 34, 138	17 75	
J. R. Marsh, voucher 82	74 14	
A. G. Brauer, voucher 105	5 05	
		174 41
LIVE-STOCK.*		
Conley & Sanker, Logan T., colt, voucher 1594	46 00	
A. C. Vandiver, farm superintendent, vouchers 1615, 2103	22 50	
Wallace Estill, voucher 1684	55 00	
H. M. Valle, bull, voucher 2025	100 00	
G. F. Rothwell, Jersey calf, voucher 1867	25 00	
B. M. Anderson, voucher 1874	6 00	
		254 50
TRAVELING.		
Jas. H. Guitar, voucher 2152	5 50	
Alex. Maitland, voucher 156	13 00	
D. A. Ely, voucher 157	11 50	
J. F. Groves, voucher 158	8 75	
		38 75
INCIDENTALS.		
G. F. Rothwell, voucher 1867	3 00	
		3 00
Total Department of Agriculture		$7,156 79
Department of Horticulture.		
SALARIES.		
C. A. Keffer, horticulturist	1125 00	$1125 00
LABOR.		
Squire Roley	266 90	
Jas. Byers	244 20	
Jas. Harris	167 30	
D. S. Scrivener	39 35	
B. B. Billups	26 15	
Howard Davis	2 60	
S. J. Anderson	6 00	
C. L. Baender	1 00	
Wm. Diggs	1 80	
C. O. Jenkins	3 90	
K. H. Hansen	1 00	

* Including service and registry.

DISBURSEMENTS IN DETAIL—BY DEPARTMENTS—Continued.

C. A. Keffer, horticulturist, vouchers 1773, 1779, 1811, 1822, 1836, 1850, 1936, 1964, 1980, 2055, 2111, special student labor..	$33 97	
Dr. E. D. Porter, (Director,) vouchers 2113, 2157, 46, 92, pay-rolls filed	443 12	
		$1237 29
SUPPLIES.		
J. J. Pauley, blacksmithing	1 60	
Andy Johnson, "	12 85	
G. L. Norvell, "	4 70	
J. A. Adams, "	27 75	
Bell & Naylor, "	1 00	
R. B. Gordon, harness repairs	2 55	
Whitelaw Bros., fungicides	39 39	
Boone County Mill Co., feed	20 00	
C. A. Keffer (horticulturist), vouchers 1666, 2002, 2067, 2127, 60, 116	21 82	
E. F. Henderson, feed	11 00	
J. R. Marsh, fuel for green-house	53 75	
A. C. Vandiver (farm superintendent), fuel for green-house	19 20	
E. D. Porter, Director (appropriation for transfer of plant display at World's Fair—donated)	100 00	
Water & Light Co., water tax	6 68	
Boyle Gordon, sand	40	
Shields & Perkins, fertilizer	8 90	
Jas. Harris, "	1 90	
Thos. Ridgway, "	3 70	
A. M. Schweisch, "	90	
W. J. Francis, "	1 30	
M. T. Weist, "	1 30	
Chas. Matthews, hardware, glass, putty, etc	27 65	
Gas company, spent lime	6 90	
Baker, Robinson & Co., barrels, baskets, tubs, twine, etc	6 00	
Loeb & Son, seed potatoes, etc	4 25	
Nowell Grocery Co., grass seed	3 40	
W. W. Hornberger, plumbing and repairs	18 50	
Belcher Bros., baskets	1 20	
Gilman & Dorsey, turpentine, etc	1 25	
McAlester Lumber Co., miscel. lumber, lime, etc	21 15	
J. C. Vaughan, seeds, bulbs, etc	29 78	
E. M. Buechly, plants, etc	5 50	
Heite Floral Co., "	4 69	
J. T. Lovett Co., "	1 38	
Whitton & Sons, "	1 90	
Burpee & Co., seeds	1 43	
Plant Seed Co., "	4 61	
Almer Bros., "	2 64	
J. J. H. Gregory, "	66	
B. F. Critchell & Co., palms	6 50	
Bush & Son & Meissner, grape-vines	25 00	
Johnson & Stokes, seeds	1 13	
Thorburn & Co., "	1 53	
Pike Co. Nurseries, nursery stock	5 80	
Wild & Bro., " "	22 05	
D. S. Lake, " "	11 50	
		557 09
IMPLEMENTS AND MACHINERY.		
Chas. Matthews, forks, scythes, rakes, garden hose, etc	16 55	
Field Force Pump Co., brass fixture for pump	10 00	
G. L. Norvell, sod-cutter	1 60	
		28 15
FREIGHT, EXPRESS, DRAYAGE AND TELEGRAPH.		
C. A. Keffer, horticulturist, vouchers 1666, 1864, 2002, 2067, 2127, 60, 116	25 19	
Pacific Express Co., vouchers 1720, 1801	3 75	
		28 94

DISBURSEMENTS IN DETAIL—BY DEPARTMENTS—Continued.

ADVERTISING, STATIONERY AND POSTAGE.		
C. A. Keffer, horticulturist, vouchers 1864, 2127	$1 90	
E. W. Stephens, voucher 1859	5 00	
A. B. Seymour, voucher 1663	30	
Burroughs & Vivion Bros., voucher 58	1 50	
		$8 70
LIBRARY.		
A. B. Seymour, "Fascicles" voucher 1663	10 50	
		10 50
FENCING AND DRAINAGE.		
McAlester Lumber Co., vouchers 1998, 6	6 35	
Chas. Matthews, voucher 1999	29 85	
Mulliner Box and Planing Co., voucher 117	166 81	
Jno. Crist, carpenter, voucher 118	27 40	
J. F. Craigo, painter, voucher 120	4 85	
		235 26
REPAIRS.		
Jno. Crist, voucher 1592	4 30	
Chas. Matthews, vouchers 1788, 1860	20 65	
McAlester Lumber Co., vouchers 1865, 59	28 70	
H. Hartwith, voucher 1889	6 00	
E. R. Rose, voucher 119	20 15	
		79 80
TRAVELING.		
C. A. Keffer, horticulturist, voucher 116, attending State Horticultural meeting at Harrisonville	16 40	
		16 40
Total department of horticulture		3,327 13
Department of Chemistry.		
SALARIES.		
Dr. P. Schweitzer, chemist	1250 00	
		1,250 00
LIBRARY.		
"Journal of Anat. Chemistry," subscription to Vol. 6	2 50	
		2 50
Total		1,252 50
Veterinary Department.		
J. R. Rippey, Secretary State Board of Agriculture, material, instruments, etc., voucher 1614	95 00	
A. J. Sandker, butcher, old claim, feed for guinea pigs, etc., voucher 2006	1 20	
		96 20
Total veterinary department		96 20

Vouchers filed for all expenditures.

IRVIN SWITZLER, Secretary,
Mo. Agr. Exp. Station.

RECOMMENDATIONS

Of the Advisory Committee from the State Board of Agriculture appointed to confer with the Dean of the Agricultural College, relative to experiments to be conducted on the College Farm and Station Grounds.

We, the undersigned, a majority of the committee appointed by the State Board of Agriculture to advise and recommend the line of work to be carried on by the Director of the Experiment station at Columbia, would recommend that the following experiments are, in our judgment, the most important, and would suggest that the Board of Curators order such experiments made.

First—A series of experiments in tile-drainage, on about ten acres of land lying west of the old "fair ground" tract. Tile to be put in at different distances apart and at different depths, so as to demonstrate the best and most economical mode of tile drainage.

Second—Continuance of experiments with potatoes as to the best varieties of early, medium and late, and best fertilizers to be used on the crop.

Third—Would also advise a series of experiments in corn-tillage, as to whether deep or shallow cultivation is advisable.

Fourth—A continuance of the stock-feeding test as now being carried on by Dr. Porter.

Fifth—Your committee would suggest that experiments be made to ascertain the best breed of hogs for the Missouri farmer. That experiments be made with the different standard breeds and that correct weights be taken weekly or monthly of all pigs and hogs, so as to determine which show largest gain from beginning of the test until the hog is ready for market.

Sixth—Missouri requires only development to make her the greatest fruit-growing state in the Union. Your committee would suggest that a competent Missourian be placed in charge of the horticultural department, and that an adequate amount be set apart for his use to carry on a line of experiments, and that tests be made of all new and untried varieties of fruits, and that reports or bulletins be issued and mailed to the public as required by law.

Signed: W. R. WILKINSON, J. F. GROVES, D. A. ELY.

QUARANTINE MEETING.

Convened at office of Secretary, March 8, 1894, defined quarantine line and adopted regulations for that season, which were fully set forth in proclamation issued by Gov. Wm. J. Stone on that date.

This quarantine line established followed the government line as defined in proclamation issued by U. S. Department of Agriculture in February, except as to the counties of Searcy, Stone and Independence, in the state of Arkansas, which this Board included in the infected territory.

Against this departure from the U. S. quarantine line the Senators and Representatives from Arkansas entered their earnest protest, and filed their declarations based upon their official honor, stating that the counties of Searcy, Stone and Independence of their State were not

now and never had been infected territory, and asking that this Board change the line so as to conform to that established by the U. S. Department of Agriculture.

Gov. Stone requested the Secretary of the State Board of Agriculture to thoroughly investigate this matter and present the facts to members of the Board. Upon the advice of the members of the Board by letter, and in conformity to a resolution unanimously passed by the executive and the advisory committee when in session June 6, 1894, the Governor issued a supplementary proclamation dated 25th day of June, 1894, declaring the quarantine line as described in proclamation of March 8, changed so as to exclude the counties of Searcy, Stone and Independence from the infected area therein described, and said changes to take immediate effect.

PROCLAMATION BY THE GOVERNOR.

STATE OF MISSOURI,
EXECUTIVE DEPARTMENT.

By authority vested in me, and in accordance with Section 8785 of the Revised Statutes of 1889, I, William J. Stone, Governor of Missouri, having approved of the following quarantine regulations adopted by the State Board of Agriculture for the purpose of preventing the spread of contagious disease among cattle, do hereby promulgate same, and order that the same be observed and enforced throughout the commonwealth.

The following quarantine line has been defined and established, to wit:

All that country lying east and south of a line commencing at the southwest corner of the county of Pecos, State of Texas, on the Rio Grande river; thence following the western boundary of Pecos county to the southeast corner of Reeves county; thence following the boundary line between the counties of Pecos and Reeves to the Pecos river; thence southeasterly, following the said Pecos river to the northwest corner of Crockett county; thence easterly along the northern boundaries of Crockett and Schleicher counties to the southeastern corner of Irion county; thence northerly along the eastern boundary of Irion county to the northeast corner of said county; thence northerly to the southern boundary of Coke county; thence westerly to the southwestern corner of Coke county; thence northerly along the western boundary of Coke county to the southern boundary of Mitchell county; thence easterly to the southeast corner of Mitchell county, and thence northerly along the western boundary of Nolan county to the northwest corner of Nolan county; thence easterly along the northern boundary of said county to the southwestern corner of Jones county; thence northerly along the western boundary of Jones county to the southern boundary of Stonewall county; thence easterly along the northern boundaries of Jones and Shackelford counties to the southwestern corner of Throckmorton county; thence northerly along the western boundaries of Throckmorton, Baylor and Wilbarger counties to the Red river; thence northwesterly following the Red river to its point of intersection with the one hundredth meridian of longitude; thence northerly from said point of intersection along said one hundredth meridian to the southern boundary of the State of Kansas; thence easterly along the southern boundary of the State of Kansas to the northeast corner of the Indian Territory; thence southerly along the eastern boundary of the Indian Territory to the southwestern corner of Washington

county, State of Arkansas; thence easterly along the southern boundaries of the counties of Washington, Madison and Newton to the southeast corner of the county of Newton; thence northerly to the northeast corner of the county of Newton; thence easterly along the southern boundary of the county of Marion to the northwest corner of the county of Stone; thence easterly along the northern boundaries of the counties of Stone and Independence to the southwest corner of the county of Lawrence; thence easterly along the southern boundary of Lawrence county to the southeast corner of Lawrence county; thence northerly along the eastern boundary of said county to the southwestern corner of Greene county; thence easterly along the southern boundary of Greene county to the southern boundary of the State of Missouri, and along said southern boundary of the State of Missouri to the Mississippi river; thence southerly along the Mississippi river to the southern boundary of the State of Tennessee; thence easterly along the southern boundary of the State of Tennessee to the western boundary of the State of North Carolina; thence along the southern boundaries of the counties of Cherokee, Clay, Macon, Jackson and Transylvania, State of North Carolina, to the southeast corner of the county of Transylvania; thence northwesterly along the eastern boundary of Transylvania county to the southwest corner of the county of Buncombe; thence in a northeasterly direction following the Blue Ridge mountains to the southwestern corner of the county of Amherst, State of Virginia; thence southeasterly along the southern boundary of the county of Amherst, to the western boundary of the county of Appomattox; thence northeasterly along the eastern boundaries of the counties of Amherst, Nelson and Albemarle to the southern boundary of the county of Orange; thence along the southern boundary of the county of Orange to the boundary line of the county of Spottsylvania; thence along the eastern boundary of the county of Orange to the southern boundary of the county of Culpeper; thence easterly along the southern boundaries of the counties of Culpeper and Stafford to the boundary of King George county; thence northerly along the eastern boundary of Stafford county to the Potomac river; thence following the Potomac river southerly to the Chesapeake bay; thence easterly along the southern boundary of the State of Maryland to the Atlantic ocean.

First—From April 1 to the first of December, 1894, each car carrying cattle in course of transportation from south and east of said line and within said area, into or through the State of Missouri, shall bear a placard setting forth plainly and in large letters that said car contains southern cattle, and each way-bill of each shipment shall have a note upon its face with a similar statement; and when said cattle shall be unloaded north or west of the above-described line to be fed or watered, the places occupied by the animals shall be considered infectious grounds, subject to quarantine, and shall be immediately set apart by the owners or lessees of the property for the accommodation of infectious southern cattle; no other cattle shall be admitted thereto. At points of destination said cattle shall also be placed in separate southern cattle-pens, as prescribed in section fourth of these regulations.

Second—Whenever any cattle that have come from said area shall be reshipped from any of the points at which they have been unloaded to other points of destination, the car carrying said animals shall also bear a placard stating that said car contains southern cattle, and each of the way-bills of said shipment shall have a note upon its face with a similar statement. At whatever point in Missouri these cattle are unloaded, they also shall be placed in separate cattle-pens, to which no other cattle shall be admitted.

Third—Cattle from the above described area shall not be transferred on foot into or through the State of Missouri from April 1, 1894, to December 1, 1894.

Fourth—All the public, railroad or other stock-yards, which shall keep or receive southern cattle for trade or transit within Msssouri, shall provide for use, between April 1 and the first of December, 1894, a sufficient number of pens to be used exclusively during that period for the accommodation of cattle coming from within the territory above described. Such pens shall be marked or designated by reasonably large signs, conspicuously posted, and bearing in plain and large letters the words "Southern cattle-pens." And all public stock-yards shall, before April 1, next, file with the State Veterinarian an affidavit, setting forth clearly that they have complied individually with this section of the rules and regulations.

Fifth—Cattle coming into Missouri from territory within the above described boundaries shall not, during the period aforesaid, be kept, grazed or watered on public ranges, unfenced lands, highways, State lands, or within the corporate limits of any town or city within the State of Missouri, unless quarantined in accordance with article 3, chapter 167, Revised Statutes 1889.

Sixth—The State Veterinarian shall, as far as practicable, co-operate with the United States Department of Agriculture in the enforcement of the regulations prescribed in its circular letter of February 15, 1894, addressed "To the managers and agents of railroad and transportation companies of the United States, stockmen and others," the object of which is to prevent the spread of Texas fever, in which the following directions for disinfection are set forth:

The cars used to transport such animals, and the pens in which they are fed and watered, and the pens set apart for their reception at points of destination, shall be disinfected in the following manner: (*a*) Remove all litter and manure. This litter and manure may be disinfected by mixing it with lime, diluted sulphuric acid, or, if not disinfected, it may be stored where no cattle can come in contact with it until after December 1, 1894. (*b*) Wash the cars and the feeding and watering troughs with water until clean. (*c*) Saturate the walls and floors of the cars, and the fencing, troughs and chutes of the pens, with a solution made by dissolving four ounces of chloride of lime to each gallon of water, or disinfect the cars with a jet of steam under a pressure of not less than 50 pounds to the square inch.

Seventh—The State Vetereinarian may appoint deputies and inspectors to aid him in the enforcement of the above regulations, and they are hereby empowered to quarantine, under such rules as may be prescribed by the State Veterinarian, all cattle brought into the State in violation of these regulations.

NOTE—These regulations are adopted by authority of section 8785, Revised Statutes of Missouri, 1889, and, if approved by the Governor, the same section provides a penalty for violation of a fine of not less than $1000 nor more than $10,000 for each and every offense, to be recovered in any county into or through which such stock is brought.

Sheriffs and constables in Missouri are hereby directed to enforce these regulations, and to arrest any and all parties who may be guilty of violation thereof.

IN TESTIMONY WHEREOF, I hereunto set my hand and cause to be affixed the Great Seal of the State of Missouri. Done at the City of Jefferson, this 8th day of March, A. D. 1894.

[SEAL] WM. J. STONE.

By the Governor:

A. A. LESUEUR, Secretary of State.

QUARANTINE PROCLAMATION.

Wheareas, On the 8th day of March, 1894, the State Board of Agriculture established a certain quarantine line and adopted quarantine regulations for the purpose of preventing the spread of contagious disease among cattle; and

Whereas, A complaint has been made to the Board of Agriculture by parties representing the State of Arkansas that the counties of Searcy, Stone and Independence, of that State, had been unjustly placed south of said quarantine line and included in the infected area, as described by said quarantine regulations.

Whereas, The State Board of Agriculture, after such investigation as was deemed necessary, and careful consideration of facts submitted, finds and determines that said counties should be excluded from the infected territory, and the quarantine line established south instead of north of them.

Therefore, the members of the State Board of Agriculture have authorized and directed that the quarantine line established at the date aforesaid, and fully described in proclamation issued from this office on the 8th day of March, 1894, be changed so as to exclude the counties of Stone, Searcy and Independence from the infected area therein described, and said line is hereby declared changed, from and after this date, so as to place these counties north of said line, thereby conforming the quarantine line of this State, as it affects the state of Arkansas, to the line prescribed and regulations promulgated by the United States Department of Agriculture on the 5th day of February, 1894, and effective after the 15th of said month.

In witness whereof, I have hereunto set my hand and caused to be affixed the great seal of the State of Missouri, this, the 25th day of June, 1894.

[SEAL] WM J. STONE.

By the Governor:

A. A. LESUEUR, Secretary of State.

INSTITUTE PAPERS.

Nobility of the Farmer.

The following paper was read by J. A. Potts, President of the Missouri State Board of Agriculture, at the Farmers' Institute meeting at Laddonia, Mo., September 25:

From earliest times the products of flocks and herds, the tillage of the soil, have been the main subsistence and protection of men. Farming in all its kinds and varieties, then, has constituted the great and honorable occupation of man since he was ordered by the Almighty to cultivate the garden. Whatsoever other occupations men engage in, all are dependent on the farmer. All civilized nations have paid great honor to the farmer, and the noblest citizens of these nations have found delight in such occupations. Along with this occupation has come man's privilege to obtain and hold certain lands for cultivation, and for making homes secure and comfortable, where he may rear his family unmolested, and enjoy and cultivate all the advantages of polite social relations and the highest civil and learned conditions of mental and moral training and culture.

Commerce, the trades and fine arts are all the result of civil conditions in which society finds itself after settling down to the cultivation of the soil and domestic beasts. Villages and cities have sprung up for the protection of society, and for the convenience of commerce and the manufacture of necessary articles, tools and machinery to be used on the farm, or for the land owners, who from time immemorial have been looked upon as the honorable among men.

With advancement in commerce came the business of banking. Money lending for usury in the earliest days was considered an ignoble business. The bankers of Venice were considered in one sense enemies to society. Some changes have taken place, however, and banking is now recognized as a legitimate business and the bankers the greatest assistant of commerce and the friend of the farmer. But after all is said, every advancement in civilization depends upon the farmer. How greatly this is seen when crops are short.

The curious observer cannot help seeing that still greater changes are going on in the social world, especially in our own land. The sound of hammers, the hum of machinery, the electric flash, in busy scenes of manufacture and transportation, display an activity or whirl of life which is at least attractive to youth and vigor, and the result is that many of our most earnest and capable young men betake themselves to these scenes, where they can run faster, work harder and make surer and more rapid gains. Extravagance and haste to be rich and to see life faster, calls many restless spirits from the farm to cities, and now the cities are swarming with idle ones, vicious and helpless, who, had they remained on the farm, would be honorable and profitable members of society. Here is one chief fault of the farmer: he does not honor his own occupation as he ought. He fancies there are many advantages and distinctions and comforts in other occupations which are not characteristic of his own. And right here he is deceived. Let every one, after taking hold of the plow, not stop to look back. With the same energy, ingenuity and thoughtful effort applied to husbandry as that in which successful persons of other occupations persevere and adapt to circumstances, every man who follows agriculture must be a good liver, a noble, honorable cizizen, and his the envy of all other occupations. This is true in numerous instances, and can be true in an infinitely greater number of cases. Let the farmer, instead of being restive and dissatisfied in his work, honor it, feel himself the same independent prince of the land that men in other occupations and professions really consider him, and he will bear heroically and gloriously the fancied ills he thinks he now has, instead of flying hastily and without due consideration to those he knows not of.

From this we conclude that our success or failure is largely due to ourselves. There have been granted among men from the first, respect, honor and power to the husbandman of the earth, and where our occupation has lost its distinctive place and noted name, it has been due to a false idea that such labor is menial. This has been true where slaves carried on the farmer's work. This was true in Greece, but not in Rome. The greatest Romans were tillers of the soil. Cincinnatus was called from the plow to rule the empire.

No lords are needed in this free land, no titled rank descending with proud estates, but every farmer who is a freeman (and we are all such) may be a lord of at least a small estate, enjoy the product of his labor in as much wealth as will make him a comfortable, progressive and important citizen in this grandest land of the earth. He can be what every lord is not—a contented and honest man, enjoying the milk and honey that flow from his own labor.

In the Interest of Agriculture.

Work attempted and accomplished by the Committee on Agriculture of the National House of Representatives.

(An address delivered by R. M. Wallace, Clerk to the Committee, at a meeting of the State Board of Agriculture, Lewiston, Mo., October 3, 1894.)

MR. CHAIRMAN, LADIES AND GENTLEMEN:

I appreciate the honor which the local board kindly bestowed upon me in extending an invitation to be present at this session. I am requested to give a report of the work attempted and accomplished by the Committee on Agriculture of the National House of Representatives, and I will cheerfully comply, only regretting that I have not data at hand which would enable me to make the report more complete and reliable. My connection with the Committee has extended over a term of seven years, beginning with the 49th Congress, excluding the 51st Congress, during the life of which, through deference to the wishes of the somewhat inconvenient Republican majority in the House, I remained at home. During this time the committee, under the efficient leadership of Hon. William H. Hatch, of Missouri, has accomplished much and attempted more. The personnel of the committee has changed with the several congresses, but during this entire time earnest and conscientious representatives of agricultural interests have held positions upon the committee, remarkable unanimity of action and zealous devotion to the work in hand being at all times noticeable.

The records of the Committee on Agriculture are not entirely complete, only partial minutes of proceedings being found since 1854. The Committee on Agriculture was organized in the year 1820, but so far as the record shows, it existed only in name for 34 years afterward. The act making donations of public lands for the establishment of agricultural colleges in the several states constituted the only important legislation recommended by the committee for the first 60 years of its existence, and during the past 10 years more laws looking to the betterment of agricultural interests have been placed upon the statute books than had before that been enacted since the organization of the government.

The room devoted to the use of the committee is one of the most spacious, eligibly located and beautifully decorated in the entire capitol building. In the year 1855, while Jefferson Davis was Secretary of War and *ex officio* Commissioner of the Permanent Seat of Government, an itinerant artist, using the unmistakable dialect of the later Rome, browned as only Italy's sun and the breezes of the great inland sea can do, applied for work as a fresco painter. Mr. Davis led the unpretentious artist to what is now the room occupied by the Committee on Agriculture, and telling him of the use to which it would be devoted, gave permission for finishing two frescoed panels with appropriate pastoral or rural scenes. The artist proved to be the matchless delineator, C. Brumidi, who afterward left his imprint upon so many portions of the capitol building, and the samples first given by his deft touches in the room of the Committee on Agriculture are known and recognized as the master-pieces of the long and notable list. In colors which will endure while the great marble pile of masonry stands, he depicted a delegation of Roman senators offering to Cincinnatus the commission and insignia of office which made him dictator, and urging him to leave his plow in the furrow while he drove the Æqui and Volsci from the Imperial city. A companion sketch represents Gen. Israel Putnam warned of the attack of the British at Bunker Hill and leaving his plow to lead his "Minute men" in the struggle for fredom. The ceiling is handsomely decorated with allegorical fresco panels representing the four seasons—Flora presiding as goddess of spring; Ceres, the central deity of summer; Bacchus, receiving fruit offerings and making glad the harvest home of the autumn, and Boreas, riding astride a cloud, king of winter and undisputed ruler of the storm. Unwittingly or otherwise, the highest compliment was paid the first and greatest of callings, agriculture, in the decorations of the room, for no other compares with it in extent and appropriateness of finishing and fitting. The room was for nearly twenty years after the war jointly occupied by the Committee on Agriculture and the Committee on Militia, a more unequal and inconsistent yoking together of opposites being scarcely imaginable. In the year 1880, however, the Committee on Agriculture made protest against further consort with their more warlike brethren, and invoking the spirit of peace, made dominant the plowshare over the sword, and the pruning-hook over the spear. Since that time the statesmen who have assembled in this room have learned the ways of war no more, but have devoted themselves exclusively to arts of peace and the upbuilding of the first and most important of callings—agriculture.

The first act emanating from the committee under the new order was that establishing the Bureau of Animal Industry, providing a system of inspection of domestic animals, with a view to the eradication and prevention of contagious diseases. This became a law during the Forty-eighth Congress, and has saved millions of dollars to the farmers of the United States—first by preventing the spread of pleuro-pneumonia among cattle, and later by giving a freer market for the meat products in the countries of Europe.

During the Forty-ninth Congress the committee considered a bill imposing a tax upon imitation butters. A favorable report was made, and in the face of stubborn opposition, the bill passed both houses of Congress. It has yielded, since going into effect, something near $20,000,000, and has stimulated the manufacture of genuine butter, without increasing the price of imitations to those who desire to use them. Bills increasing the power and duties of the Department of Agriculture, to extend the benefits of the signal service, and to establish in the several states Agricultural Experiment stations, were considered at length. The first-named was favorably reported, the second partially incorporated into the general appropriation bill for the Agricultural bureau, the last favorably reported and enacted into a law. By the terms of the Agricultural Experiment station bill, an appropriation of $15,000 is annually made for the maintenance of a station for every state that complies with the conditions, and a like amount for a central station maintained at Washington.

During the 50th Congress, what was known as the Pure Lard bill was considered at length and favorably reported. A bill proposing to extend government aid in the promotion of silk culture received favorable consideration, but was not reached on the calendar. One creating the Department of Agriculture was reported from the Committee and enacted into law before the close of the last session. This raised the Bureau to the rank of a department and made the secretary a Cabinet officer. The petitions of agricultural societies and citizens for the extension of the Signal service to agricultural districts were answered to the extent of greatly increasing the appropriation for weather reports and authorization for supplying rural communities with bulletins and Signal service flags.

The committee considered a number of important bills during the 51st Congress, favorably reporting the Pure Lard bill, which passed the House, but was not considered in the Senate. Through the individual efforts of Senator Vest and Representative Hatch, an important amendment was put upon the bill making appropriations for the Department of Agriculture, providing miscroscopical inspection of meats for export.

This has very largely increased the export of pork, as it removed all ground for objection to American products on account of real or fancied disease. A bill imposing taxes upon sales of fictitious farm products was favorably reported from the committee, but failed of consideration in the House of Representatives.

During the Fifty-second Congress the committee considered and favorably reported a bill imposing a tax upon fictitious farm products. The bill passed the House of Representatives, subsequently passed the Senate with an amendment, but failed in conference by reason of lack of time for consideration of the Senate amendments in the House. A pure food bill, which had passed the Senate, was reported to the House with an amendment, but failed of consideration in the House of Representatives. An amendment to the oleomargarine law was proposed by the committee, but the bill was not reached upon the calendar, as were a number of less important bills. A joint resolution of inquiry as to the cause of depression in the price of American farm products occupied the attention of the committee during a considerable portion of the session. Upon this question the committee made a divided report, the Democratic majority finding that the tariff, being practically prohibitive of manufactured imports, has lessened the foreign demand for American cereals and provisions, and been very largely responsible for the decline; that the most prosperous eras for American agriculture had been under low tariffs, and the least satisfactory and profitable under the highest and nearest prohibitive tariffs. The conclusion was consequently reached by the majority that the freer the exchange of commodities the better would be the condition of agriculture. The minority report declared that the decline in prices of farm products should be charged to over-production, asserting that a given quantity of grain or provisions would buy as much manufactured goods as at any time in the history of the world. These reports were the only documents ever given out by the Committee on Agriculture which partook of a political nature. Both the majority and minority reports were circulated by the hundred thousand in the presidential campaign of 1892, and doubtless bore fruit at the November election.

The Committee on Agriculture has disposed of a large docket of business during the present Congress, but how much will receive consideration by the two houses remains to be seen. The anti-option bill, reported early in the session, passed the House and is now upon the Senate calendar, while the following bills have been favorably reported and are waiting consideration in the House of Representatives: Providing an inspection of foods, drugs, drinks and medicines; an amendment to the oleomargarine law, making all imitation butters subject to

the police regulations of the states into which they are shipped and offered for sale; a bill extending the benefits of the experiment station act to the territory of Alaska; a bill transferring the Geological Survey and Fish Commission to the Department of Agriculture; providing systematic tests of strength of American timbers; providing better facilities for the inspection of American meats and guarding against improper use of diseased carcasses; establishing stations for experiment in the production of cocoons and the manufacture of American silks. A joint resolution asking that the discriminating regulations affecting American live-stock in force in Great Britain be protested against received the unanimous indorsement of the committee.

The range of attempted legislation referred to the Committee on Agriculture has been almost limitless, running through all forms of paternalism, from million-dollar appropriations for the destruction of Russian-thistle in the Dakotas, to a more modest demand of national funds for the extermination of *Oeneria Dispar* or Gipsy Moth in Massachusetts; but with rare good judgement the chaff has been blown out of the wheat, and the meritorious measures championed while the vagaries have been condemned.

To the agricultural societies of the country much of credit is due for work attempted and accomplished by the committee having in charge the legislation affecting farm interests. Through their well-directed efforts bills have been formulated and pressed to final passage, or, at least, respectful consideration.

The hundreds of thousands of petitions and memorials sent from every rural community through the agency of the Grange, the Alliance, the Farmers' Congress and other agricultural organizations, have been potent for good. If any citizen has doubted the efficacy of such petitions let him take heart, for by his silent reminder he has accomplished far more than he has suspected. Representatives worthy the name revere and respect the wishes of their constituents as expressed through petitions, and even demagogues fear to disobey the unmistakable commands of those to whom they owe their elevation to office. I could give you no better advice, my friends, than that you learn to appreciate your own influence for what it is worth; that you study well and carefully the great questions affecting your interests, and that when once convinced that you have reached a proper conclusion, you make known your views in no uncertain way. Adopt that homely proverb, "be sure you're right, then go ahead," and in the language of the pilot, "go ahead, hard." The right of petition is vouchsafed to all citizens, and none have better warrant for its use than have the farmers of the United States.

During the past 20 years we have seen the products of the farm decrease in price year by year until no longer is fair remuneration given for the labor expended upon the soil, or interest received from the capital invested in land. Last year's corn crop sold for $400,000,000 less than it would have sold for 20 years ago; the wheat crop of last year was worth upon the market $225,000,000 less than it would have brought 20 years ago; the cotton crop sold for $211,000,000 less than it would have done at the same time. Conservative estimates show that the crops of the United States give the farmers an annual return of $1,500,000,000 less than they would have done at the prices prevailing two decades ago. Have we not the right to inquire the cause of this ruinous decline? Based upon the prices prevalent at the close of the war, and admitting the fact that from this source must come the means of liquidation, the public debt, though it be nominally reduced, has not been diminished one dollar. Private debts have been increased in amount in exactly the same proportion as prices have decreased. The legislation of the past twenty years has been very largely in the interest of the creditor class, and no other calling has suffered so much as that of farming. While low prices and general depression in trade have prevailed in the rural regions, the urban population, or at least the more favored portion of that population, fare sumptuously every day and grow richer by reason of the unfair division of profits.

The wealth of the country is increased by the average annual production of the farm to the extent of more than $4,000,000,000; the value of farming land as shown by the last census was $13,000,000,000, and the total holdings of farmers and those interested in agriculture foot up the grand total of $18,000,000,000, far more than all of the other actual and legitimate wealth of the country, were the wind taken from the inflated values of corporate franchises and the water sqeezed out of the stocks and bonds upon which actual wealth must pay interest. Agriculture furnishes 74.5 per cent of the export trade of the United States, even at the present depressed prices, and serves to maintain the balance of trade in our favor and stay the outflow of gold which would otherwise continue unimpeded until the country had been reduced to hopeless and helpless bankruptcy.

Agriculture then has right to speak for its interests; it has right not alone to petition for a redress of existing wrongs, but may well demand full and ample justice at the hands of the law-making power. If gentle reminders, soft speeches and honeyed phrases will not secure prompt and favorable action, harsher measures must needs be adopted; if tufts of grass will not bring down the intruder, then sticks and stones

must next be used. Agriculture asks no special privileges, and will receive none. It claims only a fair field and no favors, the freest market the world can give, the largest consumption that universal prosperity can afford. To this end should every energy be directed, every talent be devoted. If I do not read the signs of the times amiss, this giant of untried strength is waking to a realization of its own powers, and will soon break the fetters which bind it. Hasten the day. It cannot come too soon.

Education et Agriculture.

By Prof. F. W. Hannah, Milan, Mo.

As I look at my subject before me, I behold these words coupled as they should be coupled in the mind of everyone: How the former serves to improve the latter. How the latter renders the former possible.

In attempting to develop such a subject, we are confronted at the outset with the fact that these two little words have furnished thought for countless millions, for centuries past and gone, yet the half has never been told. New facts and theories are being brought forth daily for the perfection of each. Their relation, as just intimated, is already the subject of volumes. Education in its broadest significance is acknowledged to be beyond the comprehension of a single mind; hence, in this age as an age of specialists, men are compelled to select some one line of study and pursue it almost to the exclusion of all others. Then instead of attempting to discuss in this brief article the subject as formally announced, we will select some one branch or part of education, and if possible trace its relation to agriculture.

We find our land and other lands dotted o'er with men of learning, intellectual brilliancy—men who have gone through the schools and mastered the studies laid down in the curricula, as bases for broad educations. Some continue their study and go on higher; some do not continue their study, and by a direct physiological process, rust out. Some win laurels in their chosen life work, some do not. Doubtless many a modest man or woman of brilliant intellect has discontinued efforts in some chosen line of work who might have won laurels therein but for an ungrateful populace. There is no truer maxim than "he who bears the palm should merit it," and it is the opinion of the writer that none merits the palm more than he who, crowned with inventive genius, passes through the schools, learns the truths there taught, and by some practical application of them sends the world whirling on and on in its mighty march of progress.

Invention then is the branch or result of education, whichever we may choose to call it, which we will select for our theme; and in tracing its relation to agriculture, we will of course leave many things unsaid, as well as not lay claim to the strictest originality.

We live in a most extraordinary age; events so various and so important that might crowd and distinguish centuries are, in our times, compressed within the compass of a single life. Already has our own Congress ordered an investigation of the influence of machinery upon labor, showing that invention is about to usurp the rights and powers once held by the laborer.

Then the one potent question for us to consider today is, "can the farmer hold his own with modern invention?" In modern life one of the most striking features that has been developed is the interdependence of the members of the human family. As the population increases the hermit or semi-hermit life so frequent years ago, when the farmer for months in winter saw hardly any faces save those of his own family, and when he conducted his family operations in almost complete independence of the rest of the world, is fast becoming an impossibility. In old times the farm was a self-supporting world in itself. The wells, springs and cisterns supplied water, the domestic animals got all their food from the farm, and it produced its own fertilizers. By rotation of crops, by letting land lie fallow, and by the use of fertilizing materials produced on the farm, the land was kept fertile. Rain descended from the clouds without any human agency.

Now the conditions are very different. The farmers' children wish to compete with city children in education and general culture. But outside of this personal aspect, of which the education aforesaid is but one element, modern conditions affect his life in a much broader sense. The tendency now is to work the soil in large areas devoted to a single crop, and to use machinery in all farming operations.

For many years past the American inventor has been inventing most ingenious machinery for the cultivation of the ground, for sowing the seed and for harvesting the crops. Because of the inventor's work the western farms, with fields of wheat reaching to the horizon, cultivated by steam-drawn plows, and whose crops are harvested by great machines drawn by teams of many horses, have become a possibility.

The great cereal crop of the United States is due to the mechanical inventor. In the same order of things is the modern fertilizer. For different crops different fertilizers are made in different factories. As the great natural sources of phosphoric acid were withdrawn, the European agriculturist has utilized the finely-ground slag of the basic steel process. The farmer no longer depends on his barn-yard, but

purchases his plant food in the most approved form, made in factories from the most unpromising sources of supply. The Atlantic coast is patrolled by steamers whose occupation is the catching of bony fish. After the oil is extracted from these fish, the farmer has a claim on what is left as a source of nitrogen for his crops. South American nitrate of soda is another source of nitrogen. The German mines supply him with potash, and the blending of all the nutritious elements is effected by all the great fertilizer factories, whose processes are guided by the most exact chemical analyses of their materials. Even in the matter of local transportation, the farmer is being taken care of. The electric road, to whose operations so many highways have been surrendered, bids fair to revolutionize the aspect of rural life. It is believed by many that the electric road will eventually haul the farmers' products to the cities or railroad stations, and the improvement of country roads has actually been discouraged by some who believe in the highest development of this form of traction.

Where the process of development of modern life will end, no one can say.

The farmer, who would seem to be the last to be subjected to modern scientific advancement, is really, relatively speaking, the one who is most affected. Mechanical, chemical and electrical science has changed his entire status.

Had the late solar convulsions been merely local, they would have excited only a scientific interest, but, by a profoundly scientific course of reasoning, based upon observations, science has long suspected, if it has not been able to fully demonstrate, that a most important connection exists between the occurrence of great solar activity and peculiar types of terrestrial weather materially affecting our crop seasons, and often productive of long spells of drouth. Since the beginning of the increase of solar disturbances now coming to a maximum, wave after wave of abnormally dry weather, decidedly unfavorable to agriculture, has been reported in various parts of the globe. And this periodical phenomenon, which, as scientists have discovered, recurs every eleven years, but which is much more pronounced at some returns than at others, has doubtless had much to do with causing the commercial depression and panics of the last two years. As confirming the theory of a distant connection between sun-spots and drouths, a European scientist has carefully studied the variations of the sun's heat received by the soil of the earth at different stages of solar disturbances since 1890. The result of his elaborate researches shows that in all probability the calorific intensity of the sun's radiation increases directly as the spots and other solar disturbances increase

Both encouragement and caution are to be drawn from these interesting discoveries for the practical benefit of farmers and planters. They may now, it reasonably appears, hope that in the course of the coming year, the seasonal rainfall will begin to increase and the risks of drouth will diminish. The eras of great drouth, as meteorologists have found from a study of innumerable records, rarely last more than two or three years. With the calming down of the sun, looked for in 1895, more moderate and equable crop seasons ought to follow. Thus science looks ahead and bids the farmer prepare for times of want occasioned by great drouths.

But for fear we digress too far, let us recur to our original theme. Among inventors, the farm is recognized as a field for most useful work in invention. Man may yet learn to dispense with coal, and the steam engine may yet be relegated to the past. The self-contained energies of the cosmic system may yet be used to replace the mortar which during the last decades has replaced them.

Wind-mills and water-wheels represent the utilization of cosmic energy, and mankind may yet be driven to a more extensive use of the mechanical powers of nature. But for food production, it seems as if the soil for many years to come must be the only resource. Synthetic chemistry has to make enormous advances before it can produce palatable food. Already it has done something in producing glucose as a substitute for sugar, but until the synthesis on large scale of carbon and hydrogen is effected, the synthetic chemistry will be inchoate.

Again I put the question, "can the farmer hold his own in this modern march of progress?" We answer in the affirmative. The farmer *can* hold his own. The change in his processes, the abolishment of the quiet rural life, and of the farm as an almost self-contained unit of existence, are brought about by the devotion to his interests of the enlightened world, and the world in its turn is more and more dependent on him.

Causes of Agricultural Depression.

A paper read before the Farmers' Institute at its session held at Sarcoxie, Mo., by A. W. St. John, editor of the Carthage Press.

It is only by comparison that we judge of anything pertaining to our welfare, and by taking certain periods in the history of a people, and comparing them one with the other, we judge of their relative prosperity and speak of them accordingly.

Turn backward the pages of history, or even in the memory of some of us: look at the days when all the small grains were gathered

with the sickle or the cradle; when nearly every farmer's home had a spinning-wheel and loom upon which to make the clothing; go back to the days when nearly everything used in the home and on the farm was produced and made by the farmer and his family, and prices for everything grown on the farm ruled low, and draw a comparison, and we can with some truth say, as some claim, that there has not been any depression.

The farmer of today, while, perhaps, not as well contented or happy, has many fold more comforts and luxuries than his grandfather ever dreamed of. Times, however, have materially changed. While we may look back to those days, it is very clear that the American farmer can never be induced or forced to go back to them. Circumstances and conditions caused the genius of man to invent machinery that produces ten—aye, an hundred-fold—more of the fabrics we have become accustomed to and need, than could possibly be produced by hand and the appliances used in those good old days we read about.

We have harnessed steam and put bridles upon the lightning to make them do our bidding, pull our plows, haul our loads, run our threshing machines and run on errands for us; and within the memory of some of us we have compelled lightning to take the place of the tallow dip and the pine knot, to furnish light for us to work, read and write by at night.

When, however, we look back to a period at the close of the war of the rebellion, under the impetus of a large volume of currency in circulation the energies of the people were aroused to their fullest capacity—when railroads were being built across the continent, and every man was employed in some productive enterprise—when we look back to that time and remember the prices that ruled for farm products, we can, by comparison, readily see that there has been a depression.

In a report made to the United State Senate in 1893 by a commission appointed, we find the following statements regarding the fluctuations of crops:

Corn was rated at 75 cents a bushel in 1869; it has never been that high since, though it was 64 cents in 1874 and 63 cents in 1881.

Wheat was $1.25 in 1871, and $1.24 the next year afterward. It was above $1 in each of the nine years of the twenty-four. Though the price in 1869 was 94 cents, that was 50 per cent higher than the figures for 1892. The average for 1893 is 65 cents. The average price for the thirteen years, 1869 to 1881, inclusive, was $1.05; for the remaining eleven years, 1882 to 1892, the average price was 76 cents —38 per cent higher in the first period than in the second; or, what is the same thing, a drop of 36 per cent from the first to the second.

Rye in 1867 and 1868 was $1.40 and $1.27, respectively, and it never reached $1 afterward, though it was 93 cents in 1881. It was 52 cents in 1878 and 53 cents in 1886.

Oats was but a trifle more than half as high in 1892 as it was in 1867; it was down to 22 cents in 1889 and to 24 in 1878.

Barley was $1.30 in 1868, and less than half that twenty years later, though it was as high as 92 cents in 1874.

Buckwheat ranged from $1.09 in 1867 and $1 04 the next year to 52 cents in 1878 and 54 cents in 1886.

In searching for causes, we, here in Missouri, naturally turn to those staples in which we are the most interested, so we will first turn to wheat.

The high prices which ruled twenty-five years ago stimulated a desire to produce wheat in large quantities, and caused the production of machinery with which to gather and prepare it for the market. Upon the virgin prairies of Minnesota, the Dakotas, and in California, hundreds of gang-plows drawn by strong teams turned furrows miles in length, and when the ripened, golden grain bent its bearded heads to the autumn breezes, scores of reapers, marching side by side like an invincible and conquering army, gathered it in bundles to be quickly threshed and sacked ready for the market.

A writer speaking of this system of farming describes one of the big farms as follows:

The entire area embraced by the three tracts is 75,000 acres. Farming operations conducted on so gigantic a scale seem almost incredible to persons who are only familiar with the methods of the older and more settled states. In managing the affairs of a "bonanza farm" the most rigorous system is employed, and the cost of cultivation averages about $1.00 per acre less than smaller estates. The plan adopted by Mr. Dalrymple and all the other "bonanza" men is to divide the land into tracts of 6000 acres each, and these are subdivided into farms of 2000 acres each. Over each 6000 acres a superintendent is placed, with a book-keeper, headquarters building, and a storehouse for supplies. Each subdivision of 2000 acres is under the charge of a foreman, and is provided with its own set of buildings, comprising boarding houses for the hands, stables, a granary, a machinery hall and a blacksmith shop, all connected with the superintendent's office by telephone. Supplies of every description are issued only upon requisition to the several divisions. Tools and machinery are bought by the car-load from manufacturers; farm animals are procured at St. Louis and other principal markets; stores of every description for feeding the army of laborers are purchased at wholesale; and the result of the thorough system and intelligent economy in every department is found in the fact that wheat is raised and delivered at the railroad at a cost varying little from 35 cents per bushel. The net profit on a bushel of wheat is seldom less than 10 cents, and the average yield per acre may safely be put at 15 bushels, although it often exceeds that quantity.

On this great farm, or rather combination of farms—the 20,000-acre tract at Casselton—400 men are employed in harvesting and 500 to 600 in threshing. Two hundred and fifty pairs of horses or mules are used, 200 gang plows, 115 self-binding reapers and 20 steam threshers. About the 1st of August the harvester is heard throughout the length and breadth of the land, and those who have witnessed the operation of securing the golden grain will never forget the scene.

The sight of the immeuse wheat fields, stretching away further than the eye can reach, in one unbroken sea with golden waves, is in itself a grand one.

We can readily see that production of wheat in this manner, utilizing the cheap government lands and improved machinery, cheapened the cost of production and lowered the price.

In addition to this, the wheat-growers of India and Egypt became our competitors in foreign markets, and with cheap capital, cheap lands and cheap labor, together with the latest improved machinery, they produced wheat in such quantities as to cause the price to go still lower.

To such an extent has the production of wheat increased in foreign lands, that the exports from the Argentine republic have increased during the last few years from 1,000,000 bushels a year to 24,000,000 bushels exported last year. In this way we have been driven out of the foreign markets, and have seen the prices go below the cost of production to the American farmers.

From the report of the commission named above we learn that:

Our strongest rival is India, whose farmers, during the seven years, furnished nearly one-half as much as we did of the wheat requirements of our best customer. It is interesting to note that India's exports of wheat in considerable quantities began about 20 years ago. Of the world's requirements of wheat in 1868, that country furnished only 558,852 bushels—but little over half a million. By 1887 her wheat exports amounted to 41,558,765 bushels. It has fallen off some since; the annual average from 1888 to 1891 was about 28,000,000 bushels.

Our annual average export of wheat (exclusive of flour) has been about 80,000,000 bushels during the last seven years. The Liverpool competition in that market, to the extent shown in the foregoing figures, does injuriously affect the price of American wheat.

Turning to the great cattle-growing industry in which every Missouri farmer is interested, we find that after the railroads had opened up a vast territory in the West, making avenues of communication to and through lands previously given over to the Indians and wild animals, capital sought investment in those inviting fields by placing huge herds of cattle to feed and fatten upon Uncle Sam's domain. In a few short years millions of cattle dotted the range upon the plains—the lands upon which they roamed, and the grass upon which they grew and fattened, costing their owners nothing, not even in taxes.

These cattle when sent to market came in direct competition with those raised and fattened by the Missouri farmer, upon lands in which his money was invested and for which he was taxed, and coming upon the market in vast numbers, the result could only be that this branch of agriculture became very much depressed, causing those engaged therein to become heavy losers.

To a great extent the same conditions have ruled regarding horses. They have been raised upon the western plains in great numbers to come in competition with those raised upon the farm; but other causes have led to their depreciation in price, chief among these being the use of electricity as a motive power, especially upon the street cars.

I regret that I have not been able to gather more facts relating to dealing in options and futures, together with "corners" placed on farmers' products by speculators, to show the effect these questionable practices have on agriculture.

I think, however, that we can all readily see that such practices interfere with the proper distribution of the farmers' products from his hands to the hands of the consumer, and in nearly every case to the detriment and loss both of the producer and the consumer. Prices are governed to a certain extent by the amount of any article in the market or supposed to be in the market for sale, and any series of transactions like gambling on the future price of wheat, pork or other commodities, where the actual delivery of the articles is not expected, but where the reports of sales exceed many fold the amount actually in existence, tends to bear the market and keep prices below what they would otherwise be.

It is also easy to see that when a combination is made to buy up all the wheat or pork, with a view to run a corner and compel the consumers to pay higher prices, that such speculations operate against the producer. In the first place the speculator attempting such a move always seeks to depress the price by every device in his power while buying, so as to buy at lowest possible price; then after having purchased as much of the visible supply as possible, he raises the price for the consumer to pay, and it is only the farmer who has held his products who gets the benefit of the rise in price; all other farmers lose.

Vast fortunes have been made by these processes, but always made by the speculators, and rarely, indeed, has the farmer been made richer thereby.

WASTEFUL FARMING.

So accustomed have we become to looking upon this great and grand country as one of inexhaustible wealth and resources that we have—as a people—contracted habits of wasteful, and I might say criminal, extravagance.

We have destroyed forests and burned valuable timber with a ruthless hand, thereby causing severe drouths at some seasons of the year and freshets along running streams at others, both being costly and detrimental to the welfare of the agriculturist.

We have sought to farm upon too large a scale, or to plant more acres than we could well care for, and by so doing have not been able to realize proper returns for the money invested in our lands. The careful, successful business man will never have more money invested in his business than he needs, or can use to advantage; and the careful farmer—the farmer who desires to make his business pay—should always utilize to the best possible advantage every rod of his lands, permitting none to remain idle or grow in useless brush or weeds.

Trusting in the native richness of our soils, we have allowed our fertilizers to go to waste instead of hauling them out upon the land to repay the soil that has been feeding us.

We have burned thousands of tons of straw, when every pound of it should have been returned to the land upon which it grew and plowed under to fertilize and loosen the soil. We have been wasteful and extravagant with our machinery, leaving plows to rust in the furrow where last used, mowers to lie in the meadow where the last grass was cut, and reapers to rot in the fence corner where left after cutting the last shock of wheat, all accumulating rust nearly as fast as the notes given for their purchase accumulate interest for the farmer to pay. No mechanic would ever make a success of his calling if he habitually left his tools exposed to the weather even over night, and how any farmer can expect to make his calling successful and leave costly machinery, buggies, wagons or tools of any kind for use on the farm, out exposed to rains and the dews or the scorching rays of the sun, to rot and rust out faster than they wear out, is one of the problems I shall not attempt to solve at this time.

There are those again who do not properly protect or feed their stock—forgetting that it takes less feed to keep animals in good condition if they are kept warm and well sheltered and when fed regularly, than it does when they are unprotected from the cold blasts, snows and rains of winter.

It is true that these are largely individual failings; true that there are many farmers—a large majority, perhaps—who are not wasteful, who take care of their machinery and their stock; but depend upon it, these farmers do not feel the depression when it comes, so keenly at least, and in the aggregate the wastefulness and extravagance of which we speak is one of the causes of the agricultural depression of which we complain.

We are not of those who think that a farmer should not have the best of everything that is good and intended to better his condition, that can be had.

I know that the American farmer can never go back to the habits and customs of our fathers and attempt to produce everything needed upon the farm, for times have changed with all the people, and no one can expect the farmer to be, or to act and do, much different from other people with whom he comes in contact, or associates.

One very excellent reason why he cannot is that our laws and customs will not permit him to do so. While creating labor-saving machinery and means of rapid communication to furnish the people with much that they need, we have also created official machinery that is proving very expensive and is one cause of depression to the agricultural classes.

It is entirely safe to say that the number of officials to be supported and the salaries paid for their services have more than doubled since the good old days when the farmer made all he used or consumed upon the farm.

I have shown how the prices of some staple products have depreciated in value, but am sorry to say that upon the other hand we are unable to show that taxes have fallen in like ratio, and in this fact we find another cause for agricultural depression; since as farmers cannot get as much for what they produce, and are compelled to pay the same high rate of taxation, it takes more of their labor and their products to pay them and reduces their profits to that extent.

The same rule will apply and the same results follow, regarding the payment of debts; also on transportation of products to the market.

If when prices ruled high it only took a certain number of bushels of wheat or pounds of beef to pay a debtor the interest due him, or pay the transportation of a car of farm products to the market, we can easily see that if the price of our wheat and beef goes down, and the debt or the transportation charges remain the same, it simply takes more wheat and more beef to pay the debt or the transportation charges.

These facts show that farmers' debts are one prime cause of agricultural depression, for it is those who are in debt who feel the depression the most keenly, and it is those who complain the most.

We would not seek to lull the farmer into fancied rest and security by trying to make him think "all is well and the goose hangs high."

In searching for the causes of agricultural depression, we have been compelled to ask, whence come these colossal fortunes we hear and read about as existing all over this broad land, particularly in our eastern cities?

Is wealth produced without labor?

Did anyone ever know a farmer to make a million dollars by farming? How many millionaire farmers are there who are farmers in the sense we use that term?

In pondering these queries we are forced to the conclusion that the wealth and the millions held and controlled by a comparatively few individuals were produced by someone's labor from the soil, the mines and the workshops and the factories; and it is self-evident that some have secured the lion's share, or the cream, while the great mass of wealth-producers have been trying to get along with the ass's portion and upon skimmed milk; and herein can be seen a cause of general depression and agricultural depression.

The trouble is that farmers have not been permitted to hold and enjoy the fruits of their labor, or to have the full benefits of labor-saving machinery invented to lessen the labors on the farm. The cost of distribution is too excessive.

By divers ways and means, some of which we have referred to, men who toil not, neither do they spin, yet are arrayed in purple and fine linen, have been enabled to accumulate princely fortunes and live in kingly extravagance from the labor of men, women and children who toil beyond their strength or necessity, as far as supplying all they need. We must learn that labor produces wealth; that there is no wealth labor has not produced; and when we see those holding, in colossal fortunes, wealth produced by the agricultural classes, we can, with mathematical certainty, calculate that they have helped cause the agricultural depression we see — have helped make the discontent and dissatisfaction now so apparent among all classes of wealth-producers.

Some Reasons Why the Boys Leave the Farm.

By Mrs. D. H. Webster, Austin, Mo.

There must be an aggregation of many reasons to cause our boys to leave these broad western farms where nature is so bounteous, and with but slight help yields such lavish returns.

From the bleak and stony hill-sides that constitute so many New England farms, we cannot wonder that many of the boys seek to escape, some going to the cities and many coming west, ambitious to gain farms from which the returns are more certain and far more abundant. But it is of our own western boys that we more particularly want to speak. Why is it so few of them take pride in the farm, and pride in being farmers and the sons of farmers? Of those who remain

at home, is it not true that the majority do so because, in a sense, compelled to—their fathers being unable or unwilling to give them help toward any other business, and they, lacking the hardihood to start out without capital, perforce and not from love, stay on the farm. If you were to visit every farm in our State today and give all the boys their choice of vocations, how many, or rather how few, would choose farming? Is it that the profits are so meager on the capital invested? An intelligent farmer in our community who, on account of failing health, has just sold his farm of 360 acres for $12,600, said that, although unable to perform manual labor, he annually realized more than 8 per cent on his capital, notwithstanding the present financial depression. Is it that they are afraid of work and seek to live without it? We do not believe our boys are so foolish as to think "the world owes them a living," and will pay it without effort on their part.

We must remember there is work *and* work. Not many of us like work for its own sake. There must be agreeable surroundings and an outlook that we imagine is hopeful. What are the surroundings of the average farmer's boy? We will say that he lives in a fairly good house, though usually much too small for the comfort and convenience of the family, but it has a parlor with a bright carpet and lace curtains and perhaps an organ. Well, that is pleasant for the boy. Yes, it might be, but the boy does not get much pleasure from it. It is for company and the girls. If he has a talent for music, he may sometimes sing with the others, but, as a rule, he is not expected to visit that room with much regularity. One room usually suffices for kitchen and dining-room, and, we might add, sitting room, especially for the men and boys, and its atmosphere is too often redolent of fried meat, onions, cabbage and tobacco smoke. Again, too often one lamp is compelled to do duty for the whole family during the evening. The father wants to read, the mother to knit or sew, the girls to crochet, and the boy is rather expected to take a back seat. He may read a little or study a little, but somehow he soon gets tired and goes to his room. How much we wish it were always neat and comfortable, and that he could look forward to it with pleasure; but many times it is quite the reverse, and his bed is often shared with the "hired man." This man may be a stranger whom you hired because he was stout or because he was cheap, and of whose antecedents and morals you know nothing. Many times when you think him asleep he may be entertaining your boy with stories and experiences which may not only render him dissatisfied with the uneventful home-life, but contaminate his character and blacken his whole future. Furniture, carpets and curtains that have outlived their beauty and usefulness elsewhere are considered good

enough for "the boys' room," because you say the boys are so untidy and pay no attention to the looks of things. I will grant that many boys are untidy, for the reason that they have few conveniences or incentives to be otherwise.

Farmers' houses, that of all houses most need a bath-room, as a rule are entirely wanting in that necessity, so the boy's bath is mostly confined to surreptitious swims in warm weather. Their rooms contain neither water, towels, combs, hair, clothes, nail or tooth-brushes, and when these articles are used, except the latter, it is on a back porch or in a corner of the kitchen, in partnership with several other members of the family, including the hired man. Do you wonder that he is not dainty in his personal habits? Then his trousers, usually overalls, are too often soiled with swill or the milk some ill-natured cow has lavished upon him. His coat smells "horsey" and his boots have *not* the perfume of "Araby the blest." He isn't fit to go to your parlor nor to have a nice bed-room of his own. When you say he doesn't care for nice things, you are mistaken. Order and the love of beauty are as natural to boys as to girls; but in one case it is nurtured and developed, and in the other it lies fallow, until it is no wonder the weeds of carelessness and untidiness spring up and in manhood yield a harvest of uncouth and filthy habits, that rob him of self-respect and make his wife's life a burden.

Then the farmer's "bill of fare" ought to contain many articles that it does not. As a rule the earliest and best of everything goes to market. Early broilers would taste quite as well to the farmer's boy as to the boy who lives in town, also roast turkey and boiled eggs and ice-cream. Ice-cream, do you say? Do you think it practicable for an ordinary farmer to have ice-cream as a common article of diet? Yes, I do. Any farmer can "cobble" up an ice-house and fill it during the season, if he will determine to do so. Stay at home five or six of those days you are in the habit of spending at the stores, spitting tobacco juice and telling how you would "run the government;" plan your work and be ready to harvest the ice-crop when it comes. You have the milk and eggs and the sugar won't bankrupt you. You need not have it every day, but once or twice a week, so that when your boy goes to a Fourth of July celebration, or a picnic, all his hoarded dimes and quarters won't be spent for the great luxuries of cake and ice-cream.

But you say, I cannot afford to furnish my house, clothe my family and keep such a table as you suggest. Can you afford to let your boy leave home just at the time your combined services would keep you all happy and comfortable, and struggle for a place in the already over-

crowded trades and professions, and failing, perhaps after untold hardships, become a recruit to the steadily increasing army of tramps? So many farmers who own their land and have a family around them and ought, by industry and foresight, to enjoy life to the utmost, are always under a dark financial cloud. Nine times out of ten they have a hobby. Perhaps it is that of adding to their already sufficiently large acreage —as some one has wittily said, "Buying more land to raise more corn to feed more hogs, to buy more land to raise more corn to feed more hogs, and so on *ad infinitum*." Perhaps it is the buying of agricultural machinery. If there is one reef that is, more than any other, responsible for wrecked farm life, it is the craze for farming implements. You can easily decide who are afflicted with that mania as you travel over the country. Houses and barns in the last stages of shabbiness, family ditto, fence corners, barn-yards and lots liberally ornamented with the wrecks of plows, harrows, cultivators, reapers, mowers, havesters, etc. The are bought, but not cared for, consequently must be replaced in a few years. The boys give up the struggle, the farm passes into the hands of strangers, what is left of the family moves to town, thus leaving the ranks of the producers and becoming consumers.

Do you know that our farm products, notably wheat, have steadily decreased during the last ten years? Still we hear much about low prices being the result of over-production. My friends, it is a mistake. They are due to *under*-consumption. The great army of consumers can not buy what they need. There have been more hungry people in our land in the last few years than ever before in its history. Our farms are passing into the hands of foreigners, notably the thrifty Germans and English. In the old countries a man's greatest ambition is to become a land-owner, and nothing but the direst necessity will induce him to sell his farm. To have held the same homestead for several generations is almost a badge of aristocracy. But in our country if a farmer, by mismanagement, is compelled to sell, or he is fortunate and gets money ahead, and, of course, will no longer remain on the farm, but sells out and moves to town, starts the boys in business and seemingly tries to shake off the very dust of farming from his feet. I commend to your attention the figures given below from the New York Recorder in regard to the ownership of our land:

Mr. Vanderbilt owns 2,000,000 acres of land in the United States. Mr. Disston of Pennsylvania boasts of his 4,000,000 broad acres. The Schenley estate owns 2000 acres within the cities of Pittsburg and Allegheny. The California millionaire, Murphy, owns and area of land bigger than the whole state of Massachusetts. Foreign noblemen, who owe no allegiance to this country, are permanent absentee landlords, and spend all their money abroad, own 21,000,000 of land

in this country, or more than the entire area of Ireland. Lord Scully of Ireland owns 90,000 acres of farming land in Illinois which he rents out in small parcels to tenant farmers, and pockets his annual $200,000 in rents to spend abroad.

To form this immense aggregation of acres how many small holders of land have become tenants, thereby losing permanent interest in and affection for it.

I have but slightly sketched one side of the subject, and will now give what seem to me some ways by which we may keep our boys on our farms. Don't burden yourself with debt and taxation to buy more land than you can cultivate in the best possible manner. Many think they must have a large area for pasturage, but a look at the said pastures shows their most abundant crop to be weeds. Half the amount of land, carefully seeded and intelligently watched and renewed, would suffice. Then have just as good and nice a home as you can possibly afford. Don't say "that's dead capital." It may be in one sense, but out of such death are the issues of life—home life.

Dress your boy respectably. Don't confine him to check shirts, overalls, plow shoes, and those nondescript seagrass hats, that are never the same shape for two days in succession, and each change more grotesque than the last. Of course he looks like a "clodhopper," and what is worse, he feels like one. As Henry Ward Beecher once said, "Of course clothes do not make a man, but when he is made, he looks much better well dressed." Let him have neat, not elegant, clothes for ordinary wear; for exceptionally dirty work about pig-pens and stables, overalls, canvas coat and rubber boots, that are to be removed in an outside room or back porch for a pair of slippers, and, if necessary, a second-best coat. Then most farm work can be done as well and more comfortably with gloves. I have sometimes wondered if a man thought himself a better farmer because his hands were as brown and hairy as a bear's paws. My observation is that the average boy from 16 to 20 takes as much pride in the neat appearance of his hands and feet as the girl (that is, he would if he could). (I will say in parenthesis, the newspaper wits add their mite in slurring at farmers. Their names are always Hayseed, or Corntassel, or Wayback, and their imaginary conversations an ingenious compound of illiteracy.)

Now, having done somewhat for the outward appearance of the boy, furnish him good wholesome food for his physical interior. This does not mean his menu is always to contain poultry and eggs and pound-cake; but don't keep hundreds of hens and sell every egg as conscientiously as you put your nickel in the contribution basket on Sundays. A boy will do twice the amount of work with twice the amount of cheerfulness, if he is well fed, for his mental food, a daily

paper if convenient, at least one good farm journal and a high-class magazine, Harper, Scribner or the Century. If you can possibly do so, give him a year at an agricultural college. It will open his eyes so widely to the different capabilities of soils, values of various food products, and chemical changes to be brought about before this or that can be accomplished, that he will never again go plodding down the corn-rows with no more idea of the origin and why and wherefore of life than Topsy, who thought he "jist growed."

There is one other item I will mention, as there is no farmer here who will think I mean him. Be honest in your dealings with your boy. If you give him a pig, calf or colt, don't sell it and put the money in your pocket. Do fathers ever think that they may thereby plant the first seeds of dishonesty in the mind of their son, which may grow until it ripens a crop of what the law calls crime, with its attendants of disgrace and ruin? Let the boy have the money. If it cannot be spared to put in the bank or invest in other stock, let him spend it for a suit of clothes or something he may need; but never let him think you do not consider it his—as under the Mosaic law you are not compelled to vow a vow, but when you do so, you are compelled to pay it.

My friends, will you not think of these things? All I have said will not appeal to all of you, but perhaps something may appeal to some of you. Momentous issues are upon the American people today, one of which is: shall *we* keep our land, the fairest and the best in the world, or shall we supinely let it slip into the hands of strangers who stand ready to clutch and hold it with the grip of fate? The only way in which we can do it is to train our boys into intelligent farmers, who will hold their land as a sacred inheritance, and by thoughtful investigation and observation find and develop its capabilities and rejoice in the vocation, resting on the only unconditional promise in the Bible: "While the earth remaineth, seed-time and harvest, and cold and heat, and summer and winter, and day and night, shall not cease."

Rotation of Crops.

G. W. Waters, Canton, Mo.

The value of a rotation of crops has been recognized for ages by the most expert agriculturists. Among the first of American authorities upon the subject may be cited that great statesman and philosopher, Thomas Jefferson. In a letter to Gen. Washington, just one hundred years ago (1794), he said:

> I find that a ten years' abandonment of my lands to the ravages of overseers has brought on them a degree of degradation far beyond what I had expected. * * *

I have therefore determined upon a division of my farm into six fields, to be put under this rotation: 1st year, wheat; 2nd, corn, potatoes, peas; 3rd, rye or wheat, according to circumstances; 4th and 5th, clover, where the fields will bring it, and buckwheat dressings where they will not; 6th, folding and buckwheat dressing. But it will take me three to six years to get this plan under way.

This portion of his letter is given to show that the great statesman was grappling with the problem of conserving the fertility of his lands by means of rotation and renovating crops.

I will not advocate a fixed or definite rotation of crops, for the rotation that would suit one farm might not suit another. Indeed, it might occur that the different fields of the same farm would need quite different treatment. I shall rather discuss some of the principles involved in the question, so as to arrive as well as we may at the philosophy of rotation.

For convenience I shall divide the question into two main parts:

1. Rotation as related to soil improvement.
2. Rotation as to influence on crops.

I. ROTATION—EFFECT ON LAND.

All farm crops when removed from the land take with them the plant food that they get from the soil during growth. Hence the soil is depleted by just so much as is contained in the crops removed. Some crops take largely of one element of plant food, other crops take more largely of some other, as may be observed in the following table. The three principal plant foods only are considered: nitrogen, phosphoric acid and potash—the ones that form the basis of value in all commercial fertilizers:

One ton (dry).	Nitrogen.	Potash.	Phos. acid.
Timothy (hay)	25.2 pounds.	18 pounds.	10.6 pounds.
Clover (hay)	40.14 "	44 "	7.6 "
Oats (grain)	40.12 "	12.4 "	16.4 "
Corn (grain)	36.4 "	8 "	12.6 "
Wheat (grain)	37.6 "	10.8 "	16 "
Wheat-straw	9.6 "	11.6 "	5.2 "
Oat-straw	10 "	20.8 "	5 "

(Different analyses vary some, but upon the average they are about as indicated in the table.)

By growing one crop continuously for a number of years the soil would become "one-sided," relatively more of one element being withdrawn than of the others. While rotation would have a value in keeping a soil well balanced as to its plant-food content, the greater value arises from the resultant conditions following the crop grown. Different crops, by reason of their different habits of growth and their vastly different requirements as to tillage, leave the soil in widely different conditions. Corn, potatoes and other crops requiring summer cultivation may be placed at one extreme of a rotation, and clover at the other. The resultant conditions following these two crops are widely different; hence we expect a widely different effect upon the land.

Corn or other tillage crops allow or secure the needed stirring and turning of the soil. The benefit of such tillage may be: (1) The surface soil which has accumulated the vegetable matter, and which has become the richest part of the soil by reason of plant food coming toward the top by means of capillarity, is turned down by plowing, thus in some sense deepening the soil. (2) Aeration is afforded. (3) Disintegration is promoted and hence plant food rendered available. (4) Mechanical condition improved for the time. (5) A more thorough mixture of soil so as to render it of more uniform consistency.

While these effects of tillage are of benefit to the land, there may occur (and usually do) at the same time some damaging effects consequent upon summer tillage. (1) Washing. The effects of rains in washing land freshly plowed (tilled) are so often seen that mere mention need only be made. As a rule a whole year is allowed wherein a washing rain may get in its work of gullying the fields in tilled crops. (2) Leaching. Plant food is constantly being rendered soluble by a variety of chemical and physical forces in operation. This plant food thus rendered soluble is ready for plants, and is moreover ready to be dissolved by water and carried away if no living plant roots are in the soil ready to appropriate it. (3) The exposure of soil to sunshine and wind causes a rapid destruction of humus of the soil. Experiments were tried by Boussingalt of Alsatia. He took rich garden soil, exposed it for three months (July, August and September) to the action of the weather, and found that it had lost over one-third of its humus content. Clean culture in tillage crops gives greater or less exposure, and to a marked degree combustion of humus takes place. (6) Corn and most tillage crops are surface feeders. Seventy per cent of the corn roots were found by Prof. Morrow to be within 10 inches of the top.

We pass now to the other end of the line—to the other extreme in the rotation—and note the differentiating conditions.

Clover—In this crop we have nearly every condition different. We get no tillage, but get (1) complete covering and protection to the surface; (2) Amount of washing gullies reduced; (3) Leaching prevented because of continuous occupancy of soil by growing roots. (4) By reason of shade and protection, no destruction of humus occurs, but instead great additions of humus are made to the soil as a resultant condition following clover.

(5) The conditions are such as to induce nitrifaction. In a closely covered, shaded clover field, the presence of microdemes or nitric ferment induces in some way—we may not know how—the formation of nitrates, and while clover needs and uses a relatively large quantity of nitrogen, it has the facilities somehow of causing its developement in the soil in quantities as great or greater than its needs; so that after storing it in roots and tops, the soil is not exhausted of its nitrogen, but on the other hand the amount in roots and stubble of a good clover crop is quite sufficient for a succeeding wheat crop. While possessing this nitrogen-gathering power, it should not be overlooked that by reason of the deep penetration of its roots, it gathers the ash plant-foods from a greater depth than most farm crops. While it may require a large quantity of prosphoric acid, lime, potash, etc., it gathers these largely from the lower strata of the soil which were left untouched by the shallower rooted cereals and grasses.

(6) A value in clover not to be overlooked is its effect in deepening the soil and in improving its mechanical condition, due to the force and persistency of its roots in penetrating the subsoil. Frequent mention is made of clover roots running seven to eight feet deep in fairly good subsoils. Even in gravelly, flinty or tough clay its powers of penetration are wonderful. Judge O. H. Barker stated that in Dade Co. he found clover roots penetrating into and through hard-pan. Some experiments were tried in North Carolina wherein clover roots penetrated to where it was difficult to remove the tough, obdurate clay and oint mixture. A soil and subsoil filled with clover roots at frequent intervals for many years, they decaying each time, would leave a quantity of vegetable matter, adding humus and necessarily improving the mechanical condition, rendering the soil more retentive as to storage water, and at the same time improving its drainage. Better aeration would result, and an increased root area for other plants. In my judgment it would put a field in a permanently better condition than subsoiling. Many years might be required to produce these best effects, but experiences

of Terry and others show that it is easily possible, but not in a year or two.

Between these two extremes— corn on the one side and clover on the other—come all the other crops. Oats would probably be next in approach to corn as to effect on land. There would be some tillage at seeding, then some exposure at cutting. Wheat would afford a longer occupancy of land, especially at the time in autumn when corn would not be growing; hence, not so much danger of loss by leaching. Meadow would afford continual occupancy and the most perfect protection from washing and leaching and very little exposure of soil, so that the only draft on the land would be the actual amount of plant food consumed in its growth; hence meadow is a conserving crop. Then the resultant conditions are good for any tillage crop. Blue-grass pasture is a perfect conserving crop. Besides protection from washing, leaching and exposure, the plant food taken from the soil in its growth is mainly returned by the droppings of stock, so that the tendency would be to increased fertility by so much as the plant-food that is annually becoming available. This development of plant-food occurs on all soils at a widely different rate, dependent upon varying crops and methods of treatment. It will be noticed that I speak of continuous occupancy of the soil. The idea that soil needs rest is not correct. It will not rest. If some useful crop is not grown, weeds will. The forces, chemical and physical, inherent in the soils never stop. So then the proper thing to do is to give the soil something useful to spend its energies upon, as it is going to work anyhow.

From what we have noted, it will be observed that we class tillage crops as the exhausting ones on the soil. We class clover and blue-grass (in a lesser degree) as the renovation crops, by adopting such rotation of crops as will embrace clover at frequent intervals; and moreover, such rotation as will leave the ground bare and barren of vegetation as little as possible will be in accordance with the philosophy of rotation. But the farmer's own convenience and his environments may greatly influence his specific methods to be adopted.

We pass now to the consideration of the value of

ROTATION—ITS EFFECT ON SUCCEEDING CROPS.

The resultant conditions following various crops are very different, and often it happens that a given crop succeeds much better after a crop of some other kind than after itself, or rather after one of its own kind. Experience has pointed out the advantage of rotation in this respect. Indeed this phase of the rotation question has been as a rule considered its chief merit. We look upon the first division as the more

important, for the first care of the farmer should be his hand. However, it is well to note some of the perferences that certain crops show as to what preceding crop leaves the land in a condition best suited to them.

Corn follows clover or sod crops admirably. The decaying roots of the sod leave a mellow, friable condition especially suited to summer tillage. Oats, however, delight in a soil that has been subjected to cultivation the year before; hence the common practice of oats after corn. Timothy also follows clean culture advantageously. But it should be remembered that timothy is an imperfect perennial, that it does not live many years; hence we often find timothy meadows yield to the more persistent hardy perennials, as red-top and blue-grass. When this condition begins, a rotation to a tillage crop is suggested. Wheat follows clover with good advantage, for the reasons mentioned in the first part of this paper. Wheat is a poor nitrogen gatherer, hence the store of nitrogen gathered by the clover, and left in stubble and roots, is just the thing. If, however, the stores of plant food are abundant (the land rich enough), wheat would follow corn to advantage; but it is the common experience of Missouri farmers that wheat after corn does not do well; for the corn crop has exhausted the available plant-food near the surface, and the exhaustion has been so recent that development has had no time to be made till the wheat needs its food. Clover follows wheat or rye as a rule better than it does oats, for the simple reason that the former, by reason of having made a portion of their growth in the previous fall, do not make so rapid a drain upon the available plant-food in the soil just prior to ripening; hence the clover, if sown with wheat, has a better chance for feed than with oats. Experience has pointed out the details along this line.

We will note one other feature, that of

INSECT PESTS.

By changing the crops we break up their habitat. The insects that breed in one crop do not infest others. This is so well understood that we need not dwell on it.

What is said of insects may in a measure be said of diseases. This is especially true in fruit culture. A wide rotation is the cure for rust in berries, and perhaps anthracnose.

One other thought and I close. While a farmer should as a rule make some particular crop his main one, still diversified cropping gives some advantages; it distributes his work, he is not so crowded at certain periods, and again, with the varying seasons some particular crop is liable to fail while others may do well. The farmer that depends entirely upon a single crop has nothing to rely upon when that particular crop fails. The old adage is, "don't put all your eggs into one basket."

The First Essentials of Road Building.

By Clint H. Chubbuck, Kansas City.

There is no question in my mind but that the man was right who said, not long since, that he considered the movement for good roads one of the most important of social reforms. One reason I know he was right in his opinion is from the great material benefits to the people generally and to the agricultural interests particularly.

Until quite recently but little interest has been taken in Road Improvement, in this State at least, but now the people are awakening to the great necessity of better roads.

As Americans we are considered progressive, yet I sometimes think we are a little slow to take hold of a question of so much importance as the one we are trying to present. However, I have the utmost confidence in the American people, and believe that when they become thoroughly aroused regarding this issue they must manfully rally, take it up, and it will be mastered. One great fault, and we can't exactly blame them for it, is that they have not been educated to the vast importance of good roads, until just recently, and in the language of one of our strongest advocates of good roads in this State, "the movement is progressing nicely, and we hope that Missouri will press forward until she will be the one bright star in the galaxy of States."

One of the first, and in fact the first essential to road-building is that of location. It is at this critical point that the man in charge of the work should use his best judgment. It is here we are laying the foundation for a future roadway, and we should be just as careful about locating a public road as we would be in selecting and locating a farm that is to be our future home.

Our forefathers, shrewd as they were in many respects, paid little heed to the economic engineering features when it came to laying out a new roadway, and it must be admitted that the same tendency to slight what is by far the most important part of road construction has been handed down to the present time and generation. The present generation has come by this fault— if fault we may call it — honestly, and are not so much to blame; but let us do better in the future. It is in our power to do so, and certainly we should have pride enough to want to improve the ways laid down by our forefathers, regarding this question, as we have regarded many of the leading questions and improvements of the past and present. Indeed, we should and could do so much better if our dispositions were a little more favorable and

our laws a little different. Just as long as we are compelled to follow section lines in locating our roads, we will have trouble along this line.

In adopting section lines as the lines on which to lay out our wagon roads, was committed one of the most grievous mistakes in all our efforts at road-building, the one which is the very hardest to remedy, but which must be remedied before we can ever have a system of roads we must have. Let me repeat it. Until we practically abandon our government line roads and lay them out with reference to the shortest distance, easiest grades, and where the best road-bed can be made and maintained, we will not have a system of roads that will best serve the interests of all the people.

There are many good things embodied in the construction of roads, but we consider drainage the most important one. The very first essential to every good road is drainage. Dirty water and watery dirt make traveling unpleasant, and mud is the greatest obstacle to the travel and traffic of the farmer. Mud, as you all know, is a mixture of dirt and water. The dirt is always to be found in the roadway and the water which comes in rain and snow and frost softens it. Then horses and wagons, especially narrow-tired wagons, knead it and it soon gets into so bad a condition that a fairly loaded wagon cannot be drawn through it. We cannot prevent the coming of this water, and it only remains for us to get rid of it, which can be speedily accomplished if we go at it in the right way.

Few people know how great an amount of water falls upon a country road, and it might surprise some of us to be told that on one mile of an average country road within the United States (three rods wide), there falls each year an average of 27 tons of water. Water is a heavy, limpid fluid, hard to confine and easy to let loose. It is always seeking for a chance to run down hill— always trying to find its level. In the ordinary county dirt road the water seems to stick and stay as if there was no other place for it; and this is simply because we have never given it a fair opportunity to run out of the dirt and find its level in other places. We cannot make a hard road out of soft mud, and no amount of labor and machinery will make a good dirt road that will stay good, unless we adopt some plan to get rid of our surplus water.

It is often the water on our roads that causes so much trouble, and not so often the travel. To state it briefly, every country road should have side ditches, and in many places drain tiling should be added. The ditches should be one on each side of the roadway, wherever possible. Side ditches are quite necessary because the thousands of tons of water which fall upon the average country road each year in

the form of rain and snow should be at once carried away to the neighboring creek, or some other water channel, as fast as the rain falls or snow melts, so as to prevent it from forming deep mud and thus destroy the surface of the road. We see many ditches along our roadways, but not such as we like to see. A side ditch should have a gradual falling and even grade at the bottom with broad sides. With your ditches constructed in this way they will not cave in at the sides or banks. Such a ditch will easily clear itself of snow, weeds and rubbish. In giving your ditches their location you should, if possible, have them about three feet from the edge of the traveled roadway. If the traveled roadway is 14 feet wide there will then be 20 feet of clear space between the ditches. Now and then we shall find a roadway too narrow for these figures, and in such cases we shall have to get along with one ditch and a narrower roadway. The best rule always in road construction is to use common sense. There are a few well-established principles in road-building that anyone who has given the subject any thought would have understood, says one writer, the most important of which is, that water is the great enemy of roads, and that every effort should be made to keep it out of the roads, both that from below and surface water. The under-draining of soft spongy places and constant attention to the surface, preventing the formation of ruts to serve as channels for running water and depressions to catch and hold water, resulting in mud-holes, would make a wonderful difference in the condition of our roads.

In this connection we might make reference to what has come under our observation during the past two years as to the way the different counties of the State are beginning to use sewer pipe for culvert work. Some counties have used several car-loads. This is a step in the right direction, and we hope to see much more of it used. All that is required is for those who lay it to be careful and place same in properly and with a sufficient amount of covering. When this is done you have a culvert that may cost a little more to begin with, but is by far the cheapest in the long run, for such a one will last a lifetime.

Returning again to the subject of road construction, we wish to say that it will bring into use the improved road machines, and no one will dispute the fact that the improved road machines of today are suited to building our average dirt roads, besides being money and labor-saving machines. With them you can do more and better work in grading up a roadway than can be done by any other known means.

Selecting a road machine is of more importance than some people think. In the selecting of a road machine the following points should be considered:

1. The simplicity of its mechanical construction.
2. Ability of machine to handle hard earth, stones, gravel, etc.
3. Ability of machine to plow,
4. Freedom from side slipping and ability to furrow from banks.
5. Lightness of draft.
6. Ability for doing general road work, ditching, etc.
7. Ease of management, strength, and quickness of action when power is applied to blade.
8. Ability to take practical angles in adjusting machine to a variety of work.
9. General utility.
10. Ability to dress up and smooth the surface in finishing the road-bed.

If you will observe these special features of merit in selecting a road machine, one of the most agreeable things in the use of same is the fact that each time the machine is used the work becomes easier, better done, more satisfactory and better in appearance. We might go on to quite a length and tell how to use these machines and what would be the result, but time will not permit. Suffice it to say that a good reversible road machine with two or three teams and three men will build from a half-mile to a mile of average road, depending of course on the width of road and the amount of earth to be moved. On the other hand, a conservative estimate shows that to do the same work in the old-fashioned way will require a plow, slips, three teams and at least forty men. With the road machines should be as heavy a road roller as it is possible to get, thus compacting the soil as it is worked into the roadway. Following this there should be a wide reformation as to wide tires on heavy wagons, allowing none less than three-inch tire to be used with loads of one ton. Should we observe a few of these essential things, we would have good dirt roads for the greater part of the year. Surely I am not alone in the opinion that there is no better road made than a dirt road when it is good. But as the population and traffic increase, the need of metal surfacing increases. So how important it is that all road work—that is, locating, grading and draining—should be done with the fact in mind that the time will come when some sort of a permanent surfacing must be applied to at least all of the main roads.

There are many other important points of consideration that come under these heads, which I have neither the time nor ability to adequately discuss. The great stumbling block in our way now is the money question, and another is the road law best suited to bring about the much needed good roads. Am inclined to think the road law enacted by the 37th General Assembly, known as the Local Option law, should have our consideration, and if given a fair trial by the people will prove useful.

Horticulture and its Influences.

A. W. St. John, Carthage, Mo.

"Tis the night time for the vines and fruit-trees, and all are at rest. The strawberry vine lays its humble head upon its bed of leaves, and, nestling close to mother earth, sleeps. Vines of greater proportion bend their forms toward the cold earth, and in unison with their more stately brothers, the standard fruit-trees silently nod their heads before the gentle breeze or winter blasts, taking their rest—their annual sleep."

Not so the thrifty, wide-awake horticulturist. While the trees and vines he has been pleased to plant are resting preparatory to bringing forth their wealth of green leaves, beautiful bloom and luscious fruits, he is ever alert to guard them against their enemies, to study their habits and their needs, or to meet with his fellows to discuss plans, methods and varieties, that success and pleasure may crown his well-directed efforts.

Those who would enjoy this calling and send forth ennobling influence must be adapted to the work. They must be full of hope, and capable of looking forward cheerfully to the coming crop, or of a year in advance if perchance that of the present should be a failure. If they can do this, they will enjoy the bursting of the buds in the early spring, the coming forth of the leaves, the beauty and fragrance of the blossoms, the formation of the fruit, and achieve genuine pleasure picking, eating and marketing it when ripe. And all the time the influence of such persons, though exerted as quietly as the bursting of the buds and the growing and ripening of the fruit, will be for the good of their neighbors and the upbuilding of society.

The successful horticulturist, to make his calling send forth the best influence, must have a mind that loves form and symmetry, so as to enable him to plant his vines and trees in straight rows and cause his trees to assume proper shape; for such things create pleasurable sensations in the minds of all who view them, and naturally have a good influence, causing others to emulate him.

Having a knowledge of the forms and habits of his trees, he is enabled while his orchard is young to look forward and in imagination see the shape he would have them assume; and then, like a loving parent rearing his children, he must train and trim them in the way he would have them grow. He learns to carefully watch them as they grow, and with pen-knife in hand will often walk along the rows,

looking at each one, and when he sees a bud or a limb which, if allowed to grow, will cross or crowd another or make the tree ill-shapen, he will gently nip the bud or clip the limb, so that in later years the large pruning-knife or saw will not have to be used, leaving the ugly scars upon its body; or he may find a tree leaning from the straight and upright way, which he will gently straighten. He learns to watch with tender care his children as they grow, and if he sees one leaning or taking a "shoot" which, if not checked, will mar its symmetry and beauty, he at once gently checks or straightens it, fearing if he waits too long the heavy hand of the saw may be required, and by its use leave ugly scars upon its character.

The health-giving influences of horticulture are of no small importance, and are generally considered of great value to those engaged therein; yet much depends upon how the fruit-grower is situated and how much pleasure he takes in his work, so far as his receiving the full benefit is concerned.

Those who feel compelled to work beyond their strength in any calling, or those who are discontented and always ready to look on the dark side of life, rarely have good health; but those who take pleasure in their profession, and can take needed rest and recreation, will find this the most healthful of occupations. The open air, sunlight and fragrant bloom, the many varieties of or changes in the line of work, the pleasures incident to watching the growth and unfolding of tree, bloom and fruit, together with the well-known health-giving properties of ripe and perfect fruit as an article of diet, are all conducive to good health. Fruit, being the natural food for man, is healthful, and also helps in the formation of character. The little child and the most refined, tender-hearted person does not hesitate to pluck and eat, knowing that no pain is given, no life is taken; while to kill the fatted calf, the pet pig or pretty chicken is something they would rarely wish to see done, and never wish to do it.

Physiologists tell us that the formation of our character partakes largely from the food we eat; and upon this hypothesis it is claimed, other things being equal, that those who live largely upon a fruit diet acquire the most even temper and best nature, and become the most agreeable associates. It is also known that as good fruit is not stimulating in its nature, its use does not lead to a desire for strong drink, but tends rather toward temperance.

Thus we see to some degree the ennobling influences surrounding the horticultural profession. A man who is capable of planting an orchard that he is proud of—one which attracts the admiration and brings praise from the visitor or passer-by—cannot be contented with

crooked, zigzag rows, or with gnarled and misshapen trees, or unsightly weeds and grasses surrounding them and crowding in and covering his vines and flower-beds.

To such this calling causes the very atmosphere surrounding him to be filled with a desire for the beautiful, upright and symmetrical, and he desires to have all persons grow with upright and lovely characters, uncontaminated with low vices which surround the young in some communities, as cockle-burrs and noxious weeds surround the crooked and stunted trees and neglected vines of some fruit-growers. The influence of the first named is far-reaching in causing his neighbors to emulate the example he sets.

He also establishes a reputation for himself in the markets, which enables him to receive the best prices for his fruits, as the purchaser knows that the fruit at the bottom of his baskets or boxes will be as good as that at the top, largely because fruit grown upon healthy, well-cared-for vines and trees is always more perfect and alike than that grown upon neglected trees and vines.

Of the first named are the fruit-growers of Jasper county; but there are those just over the border, in Kansas, perhaps, who, from their dwarfed and stunted orchards and in harmony with their dwarfed and weed-grown characters, have caused persons to read upon their baskets and boxes the well-known legend, "The best is always on top."

There are other influences pertaining to this business of perhaps more practical importance and utility than those I have named, as they come closer home to our material welfare.

It is useless to attempt to present statistics to show the great commercial value of fruits grown and shipped to the markets, the vast amount of business given to railroads, express companies and commission men, the large number of people given employment and money distributed throughout the country in connection with this business. In this regard its influence is far-reaching, extending to all portions of the commercial world.

I do not know of any line of business or occupation pertaining to productions from the soil that has grown so rapidly and yet so quietly during the last twenty-five years as that of horticulture, or that has exerted greater influence for good to all people. If to make two blades of grass grow where but one grew before is to make a man a benefactor to his race, as has been written, what a grand benefactor has the horticulturist been who has caused thousands of trees to grow and hundreds of bushels of fruit to be eaten where few grew and but little was eaten before. Fruits which were unknown to half the

people twenty-five or thirty years ago, except where some traveler or writer has described them, are now sold in all the markets at such prices as to enable nearly all the people to place them upon their tables in every city and hamlet within reach of rapid transportation.

Speaking of the growth of this industry, I have thus far referred to it only in a general way, but, being proud of having been a pioneer in the business here, I will perhaps be pardoned if I tell something showing its growth as I have witnessed it in this vicinity. Twenty years ago there was not a pound of fruit shipped out of this county, but during the last five years there has been shipped from Sarcoxie alone an average of ten carloads of strawberries each year, and from the county not less than forty carloads of this fruit; and during the same time this county has exported from two hundred to eight hundred carloads of apples and other standard fruits.

Speaking of the shipments of fruits reminds me that horticulture has had its influence upon the transportation question of our country, but there is room for greater influence in that line before justice is done those engaged therein. Owing to the large quantities grown, transportation companies have been led to build cars especially for that traffic, and in some sections special fruit trains are run, devoted exclusively to that business. Owing to the co-operation of fruit-growers, in some sections they have secured reductions in rates having therein better profits than the labor and capital invested; but, as a rule, the railroads, and especially the express companies, instead of carrying these products at prices which they could well afford, have taken all that the traffic would bear, or the lion's share, leaving the producer to foot all losses of every nature.

While the fruit-grower is thankful for every convenience given or concession made by transportation companies, yet he is well aware that until he can secure a better system and lower freight rates—a system that will not compel him to help pay dividends on huge blocks of watered stock, by the freight rates he is compelled to pay—his business cannot be as profitable as it should be.

There is hardly a limit to the fruit that can be grown in this southwestern country, and from the ripe strawberry growing beneath our feet in the month of May, to the apple whose rosy cheeks have been kissed by the rays of the summer and autumn suns and moistened by the gently falling dew and rain-drops, there is none better grown anywhere. Our location is not only favorable for the production of the choicest fruits, but we are most fortunate in being within reach of the best markets known in all the great West for these products. We are within reach of all the Northwestern states, from the great lakes in the

east to Colorado in the west, where but little fruit can be grown, and in addition we have the great South lying at our feet, as it were, which readily takes all the apples we have to spare, as they cannot be grown in that section of the United States. It can readily be seen, I think, that with suitable transportation facilities and reasonable rates, with railway and express systems run by and for the people, rather than those run by and for the corporations, the influence of horticulture, as represented in Southwest Missouri, would become far-reaching and vast in its proportions.

Instead of being purely selfish like some occupations, reaching out like a huge octopus to gather from the people and blight all it touches with its non-productive or poisanous influence, this horticultural "horn of plenty" pours out healthful food and great pleasure to millions of people, increases the commerce of the country, dispenses large sums of money and gives employment to thousands of people, making them self-sustaining and helping them to become the best of citizens.

The influence of horticulture upon the principle of co-operation has already accomplished much, but much more remains to be done in that line for the benefit of all who are in any way interested therein. Too much cannot be said of the benefits of co-operation among fruit-growers, especially when it comes to shipping and marketing their products. By this means lower freight rates and greater conveniences for shipping can be secured, and the liabilities of glutting any particular market very materially lessened. Anything which tends toward co-operation among the people is beneficial and elevating in its influence, and horticulture has done much in that direction. We have all read and admired that old poem entitled "Woodman, Spare That Tree;" and possibly when walking or riding along under the cooling shade of trees planted by the roadside, a feeling of thankfulness and gratitude wells up in our hearts and minds toward the man who planted them, even though he knew that others would enjoy their kindly protection more than himself, or after he had passed on to other spheres.

We have also learned of the influence forests have upon the seasons—how their destruction has caused floods to increase in force and frequency at certain seasons, and intensified the drouths of others, causing large tracts of land once productive to become barren wastes.

These facts lead to the well-founded belief that horticulture extends an influence over the seasons, and that the planting of orchards and forest trees upon nearly every section of land, as we see them in this southwestern country, not only helps to break the storms as they sweep down upon us from the northwest, but also have an

influence for the good of our country in producing more even and regular rainfall, thus lessening the prevalence of drouths.

It is a fact within my own observation, and often mentioned by others, that as the grass and orchards planted in this section of the country during the last thirty years have grown up the rainfall has become more even and regular, and drouths less prevalent and marked in their severity.

In conclusion I say to you, plant and grow trees, if not for yourselves, for the good of those who come after you, and, though they know you not, they will bless you.

Grapes in Missouri.

G. W. Waters, Canton, Mo.

Traveling over Missouri for several years past in institute work, I have noticed the great quantities of grapes on sale at every village, town and city. The consumption of this fruit by our people amounts, doubtless, to hundreds of carloads annually. Upon inquiry we learn that these grapes on sale are shipped from distant parts, coming often from Atlantic states on the east and from the Pacific shores. The question arises, Why is this—cannot we raise grapes in Missouri? Or, if we can, is the quality such as to supply the place of the imported fruit? To both these questions we answer an emphatic yes. Any land that is fairly well drained will raise grapes. While they will grow more vigorously on rich land, they will grow and bear profusely on the rocky wastes and flinty barrens that are now considered worthless. From actual test and extended observation, we are confident that in no state in the Union do grapes grow with a finer bloom or richer flavor than in Missouri. We allow our lands to rest in idleness, or spend their forces in the production of scrub-oak, pignut hickory or worthless weeds, and send to other states and countries for tens of thousands of dollars worth of fruit, that reaches us often in immature or musty condition—not in any sense comparable in quality to the fresh, juicy fruit plucked from our own vineyards. We tested this matter at Palmyra and at Harrisonville. At the former place samples of grapes presented by Mrs. W. H. Lee, of that place, and the writer, of Canton, were placed side by side with the best basket grapes to be had on the market. The home-grown were far superior. At Harrisonville the home samples were furnished by Mr. Rarick, fresh

cut from his vines, and the comparison was even more favorable to the home-grown. We mention these matters to assure the reader that Missouri soil and climate are finely adapted to the production of the finest grapes.

We now endeavor to point out some things necessary to be observed in the management of a home vineyard. I will not enter into details as to propagation, planting, tillage, etc.; but may say that grapes respond to good treatment, but will stand more hardships, perhaps, than any other fruit. Good tillage is important, especially keeping the weeds down. I would rather have my vineyard in blue-grass than in partial tillage, whereby great crops of weeds were allowed to grow in midsummer, just at the time they would do the most harm in drying and hardening the soil.

PRUNING

May be done any time after the leaves fall till the sap begins to rise, as indicated by "bleeding" when the vine is cut. It is perhaps better to prune early—say November or December. Prune back severely. Keep the bearing canes as near the base of the vine as convenient; not right on the ground, as in Southern California, but not more than two feet from it. Keep in mind two things when you take shears in hand to prune: That the last year's buds throw out the fruit spur upon which the grapes are to grow: e. g., the wood that grew in 1894 will put out the fruit spur for grapes in 1895. The wood of 1892 or 1893 will not bear a grape. Now, in pruning, leave two and sometimes three buds on as many of these new canes as you think you will need, remembering that each bud will throw out a spur with two or three bunches on it; hence if you leave three buds on a cane you will have six to nine bunches, so if a great number of canes are left the chances are you will overload your vines. Better clip off a lot of the smaller canes, and occasionally cut out an entire vine back to the ground, or as near as you can, so as to induce a new vine for future use. The other thing to bear in mind is, where the fruit-bearing vines are to be propagated for the next year it will not do to keep on lengthening out the vine from year to year, as after a while your fruit would be too far removed from the base. So it is important to keep raising new shoots and new vines from as near the ground as you can, and as the new ones come into bearing cut away the old ones. Grape-vines do not heal, neither does a limb cut off induce rot or decay to any great extent; but the best way is to get the new shoots from the ground. In that case, when the new vine comes into bearing one of the old ones can be cut away at the ground.

As to summer pruning—pinching back, as it is called—there is a difference of opinion, based on different experiences. I have practiced summer pruning, and will continue it so long as it proves as valuable as it has in the past. How it is done: As soon as the grapes are well formed and the vines have grown three feet long, cut off within one and sometimes two leaves of the grapes. This affords enough leaf development, as a rule; for it should be remembered that the leaves are the lungs as well as the digestive organs of the living plant, and the entire development of the fruit as well as the vine is dependent upon the leaf. Good judgment, therefore, should be exercised, and the vines not denuded of their foliage more than necessary to curtail excessive vine growth. When the second growth becomes excessive another pinching may be useful, allowing one leaf to remain on this lateral.

SPRAYING.

The great enemies of grape culture, rot, as well as mildew and probably anthracnose, have been subdued absolutely by spraying with blue-stone. The triumph is absolute and complete. You need have no fears of failure if this is properly and persistently done. Spray first time before the foliage appears with the following:

Blue-stone, six pounds in forty gallons of water.

Then, after grapes shed the bloom, and about three times more, at intervals of ten days, use

Six pounds blue-stone dissolved in water.

Four pounds lime slaked under water for forty gallons water. You may add four ounces London purple as an insecticide. It may do some good and will hurt nothing.

SACKING.

If you want something nice for late use, put two-pound paper sacks on, one sack on each bunch. It does not do well to try to put two bunches in one sack. Pin them on, turning ends of sack over the vine. This is perfect protection against rot or mildew if put on early—as soon as the grapes are fairly formed; also it is protection against birds, and causes the grapes to ripen later. Grapes thus kept in sacks will be fine for late use—much better than those kept in cold storage and then shipped thousands of miles.

Soils for Orchards.

By W. F. Hoy, Farmington, Mo.

The soils in which orchards are planted should always be in a thorough state of cultivation: that is, whether in sod or in hoed crops, the land should be in good tilth or fine pulverized condition, fertile and free from hard or sour places. And right here I should say, never plant an orchard in poor soil. I have seen farmers plant their orchards in the poorest land they had, and think they will save their best land for farming purposes. There is where they make a great mistake, for I think the orchard is the best paying crop of all. On the other hand, their trees will not grow, and if they do grow they will not give good results, and then these farmers say fruit does not pay. Fruit trees want good soil and good care. There are exceptions to this rule in case of certain rocky or steep lands upon which it is decided to plant apples, but for all orchards which are planted directly for commercial purposes, this advice has few if any exceptions.

It is generally best to put the land into hoed crops, such as potatoes or corn, before the trees are planted, although sod land, if well fitted and naturally in good condition, often gives excellent results when it is turned over and planted at once in orchards; but most soils need thorough cultivation to bring them into a mellow and uniform condition. Many of the bad places in the orchards where trees die out the first two or three years could have been discovered and corrected if the land had been devoted to one or two hoed crops, for the owner would have observed that they were too wet and lumpy, or had some other serious defects. Land looks more uniform when in sod than when cultivated, and the farmer may be led to over-estimate its value for orchard purposes.

It may be said that familiarity with a particular piece of land which comes of frequent cultivation enables the careful fruit-grower to judge more accurately of its adaptability to particular fruits, or even to special varieties. Lands which have an imporous subsoil should be plowed very deep or subsoiled before planting the trees; and in all cases subsoiling is advisable, for it lets light and air in the soil and keeps moisture better, and I believe trees will make better top-roots. Land which holds surface water, and which remains cold and sour long after rains, should always be thoroughly drained with tile before trees are planted, although it should be said that such lands are frequently unfit for orchards, because the soil is likely to be hard

and cloddy. It is undoubtedly true that tile-draining benefits all lands intended for orchards, but in the majority of cases, especially in rolling lands, it is a question whether it is worth the labor and expense; yet many rolling lands require drainage, because they have hard and tenacious subsoils, which are near the surface.

The clay lands upon which pears and plums thrive give very good results, if well under-drained. I have pear and cherry trees planted in clay soil which I subsoiled, and they are growing fine. I never saw trees do so well. In fact, all fruit trees do a great deal better when the land is subsoiled. The first fruit trees I planted when I came to this State, I just plowed and did not subsoil, but the last two years I have subsoiled, and the trees are doing a great deal better in the subsoiled land, and my corn crop that I have been raising in my orchard has improved by it.

I would advise any one to plant corn or potatoes in a young orchard till the trees are four or five years old, and, if in corn, cut up when ripe enough and sow in rye with a drill, and skip about four or five feet where the row of fruit trees are, or leave a circle of four or five feet around the tree, and in the spring, when the time comes to plant corn, plow the rye under, and it will improve the land and will raise good corn or potatoes. Where there are only a few acres of fruit trees planted, I should always advise any one to plant potatoes in the orchard.

Second—In getting the trees, never buy fruit trees from a traveling agent. Buy your trees direct from a responsible nursery, or from some responsible agent who knows something about horticultural works, and can always give a man good advice in regard to varieties.

I would not advise planting too many varieties, especially for commercial purposes.

When a man receives trees or plants he should never expose the roots more than necessary. Wet the roots well with water and heal in. Cover the roots well with ground, and when well covered pour plenty of water on. When thoroughly wet, throw dry ground on top to keep from baking. When ready to plant, have a slide or kind of a sled made of planks, on which you put a barrel and hitch a team to it. Fill your barrel with water, drive to where the trees are healed in, and put your trees in the barrel of water. Then drive to where the trees are to be planted, and take the trees out of the barrel one by one as they are planted. In this way the roots will not be exposed to the sun or air, and the water is beneficial to the roots if they are not kept in too long. I have always planted my trees on this plan, and have

always had extra good luck in having my trees grow. If trees are good and fresh, and planted the right way, they cannot help but grow. I planted 500 trees the last spring, and, as dry as the season was last summer, I only lost four out of the 500 trees.

In trimming the fruit trees, cut all roots that are cut from taking out of nursery. Take the knife and make a smooth cut, and then top according to the roots the tree has. Keep the top trimmed as the tree grows. Never leave the tree alone without pruning till it is grown and then go to trimming it with ax and saw, as many do in this country. It hurts, and in many cases will kill the tree, because it cuts part of the heart out of the tree—cuts part of the liver and lungs and blood from the tree, for the loss of which it will have to suffer. Therefore, I say keep it trimmed from small up, as you wish it to grow, and cutting large limbs will be avoided then, which will be a great blessing to the tree. I claim it is the same with the fruit tree as it is with a man when he has to spare an arm or leg: it hurts, and the man will never again be what he was before he had to spare the limb. What is nicer than a well-kept orchard or farm? A person traveling the road and passing by an orchard can soon tell whether the owner cares anything for his orchard, and it is one of the best-paying lots he has on the farm, if kept in order.

One other thought comes into my mind that I wish to mention. I have seen so many men buy fruit trees and then take them and go into their old orchards and plant the trees in places where others have died, without digging out the old roots that are left in the ground, which is a great injury to the young tree, and it will most always die within a few years. So often the orchard is in blue-grass sod, which is also hurtful to the young tree, especially the peach tree, which nearly always dies the first year, and if not the first, the second year will finish it up. A peach tree will not stand a blue or red-top sod. A fruit tree wants cultivation the same as corn. Plant corn in sod and do not work it, and what do you expect of your corn-field? Nothing. So it is with the fruit tree. A man cannot expect to plant an orchard in sod and have good fruit from his trees.

Horticulture.

By Judge Miller.

That the fruit crops have failed to an alarming extent for the last three years in most sections of Missouri we all know, but it should not discourage us. Ever since man commenced to till the soil and raise fruit, these seasons of failure have occurred, and will continue to occur to the end of time. It has been my lot to visit 19 of our states, but in none do I believe are the advantages of soil, climate and diversified situations so completely adapted to fruit-growing as in Missouri. The success of the immense orchards in the southwest is showing the possibilities of that part of the State.

Between the Missouri river and Montgomery City are tens of thousands of acres of hilly, rocky land which will never be fit to grow crops of grain, that will grow as fine apples, peaches, pears, plums and grapes as any one need wish.

Here on the river hills I have grown as fine Newtown Pippins as ever grew along the Hudson river in New York. Also as fine Northern Spys and Yellow Bellflowers as ever grew anywhere; pears and peaches likewise.

The blight has of late years destroyed most of my pear trees, but even this dread disease may be overcome.

When sending some of our choice apples to a western New York editor a few years ago, the reply came that my fruit was so superior to that usually grown of the same variety that they hardly recognized it.

This being the case, there is no reason why these hills may not be planted in fruit trees to supply the demand for the future generations, as all the tillable land will be needed to grow grain for bread.

I have now lived here near thirty years, but have the first knot to see in a plum or cherry tree—a great evil in many regions. Nor have I ever seen a rose-bug—an insect that in many places is a regular pest, and demoralizes the cherry crop and the roses.

Grapes have been rotting badly for some years past, but this season they escaped pretty well. I have now grapes in my office that will vie with the brag California Triumph, Secretary Jefferson and Moore's—bunches weighing a pound each and luscious. The passengers on the cars that stop here buy them quickly at 10 cents per pound. Concord and ordinary varieties sell for 2 cents per pound. I mention this simply to show what can be done.

But for the coming horticulturist there is a work to be done, if success is to be obtained, that in former times was not thought of, because not needed. He must select the proper varieties of fruit to plant, have the soil prepared deep and made rich, plant carefully, prune and cultivate properly. He must spray against insects and fungoids. Instructions how to spray and when can be learned from any good newspaper.

When trees over-bear, thin out the fruit, and when ready to gather it will all be a marketable article. Sort well, if need be, pack carefully and always give good measure, and it will pay. The old-fashioned, slip-shod style will not work in this enlightened age. Now I will come down to the common farmers, who can so easily have some real luxuries with so little trouble and expense, of which they deny themselves. Take it on an average, I am satisfied that not one farmer in 50 in this county has a strawberry bed, and not one in 500 that has a collection of strawberry, raspberry, currant and blackberry patches on his place.

If they really knew what pleasure it gives the children and the women, who are in the house most of the time, to go out in the garden and pick these fruits to eat whenever they like, and to have them at meals, I am sure they would get them. They are a luxury, and they are conducive to health, and will save many a doctor's bill, and are a much greater benefit than many suppose in the cause of temperance. Plenty of fresh fruit will take away the craving for strong drink, which is such an evil in our country.

Strawberries for the Farmer.

By Z. T. Russell, Carthage, Mo.

In traveling over the various parts of the state, I have seen very few strawberry beds, in comparison to the number of farmers. It is the exception rather than the rule for a farmer to have a nice lot of strawberries, sufficient for the use of his family. This is all wrong. Every man who pretends to be a farmer and cultivates the soil at all should, by all means, have strawberries of his own raising, that he and his family may have them fresh from the vines each day as long as they last. There is really no good excuse why any farmer's family should be without a supply of these luscious, tempting and healthful berries. I have yet to find the first person who does not like strawberries. Children especially are very fond of them. Why so many places are without a bed of these berries is more than I can under-

stand, for there is nothing on a farm that yields a larger return in actual benefits and pleasures obtained than the strawberry; and there is nothing strange, mysterious or difficult about its cultivation. Any one who knows enough to raise potatoes can raise berries, if he will; and any one who can raise onions or tobacco can, with equal ease and certainty, raise berries, that are far better for him, and especially for his family, to use. They are so beautiful, so good and so healthful, that no one can excuse himself for not raising them on the ground that they are not liked by himself or family. They will yield so enormously, and are so much more luscious, appetizing and healthful than pork, dried fruits, etc., of which, to a great extent, they take the place, that no one can truthfully say they do not pay; for what can pay better than that which, at a little cost of money, time or labor, supplies a family with the very best to be had in the land for five to six weeks each year? Neither can one excuse himself on the plea that he has not land enough. If he has a town lot 50x150 feet, he can raise all the strawberries his family can use on what is left of it after his house is located.

SOIL FOR STRAWBERRIES.

Strawberries can be grown with good success on any soil where wheat, corn or potatoes can be grown. In fact, they are often grown on soil that is not well adapted to either of the above crops, and I believe could be raised on any dry foot of land in Missouri. No one need have any fears on account of his soil; if he will plant the right varieties and care for them properly, a bountiful crop will be the result. It is true that on some soils some varieties will not succeed; but no one need be discouraged on this account, for varieties can be found that will succeed on any soil where farm crops will grow; and every man who farms, of course, has some kind of this land.

PREPARATION FOR THE SOIL.

In the spring, as soon as the soil is in good condition to work, clear off all trash and litter from the ground to be set to berries and plow it as for potatoes. After it is plowed, scatter a light coat of old rotten manure over the surface of it, if it can be had, and harrow it in thoroughly. Also, if any wood ashes are at hand, sow them thinly over the surface and harrow again and again, until the surface is perfectly fine and loose.

SETTING OF PLANTS.

The plants should be set in rows four feet apart and about two feet apart in the rows, requiring 5000 to 6000 plants to an acre. They may be set in any way that is most convenient, but should be perfectly

straight in the rows, so that in cultivating, as narrow a strip as possible may be left to be stirred and weeded out by hand. They should also be set at the right depth, which is with the crown at the surface, neither above nor below. If set too deep, they will often rot or be smothered out; if too high, the wind will dry out the roots and failure will result. Care should also be taken to press the soil about the roots very firmly, and that the roots never be allowed to get dry. A good way is to have the plants in a bucket in which is about four inches of water, and to take them directly from that and set them into the ground.

CULTIVATION.

In a week or ten days after they are set, cultivate with a fine-tooth harrow, or some instrument that will stir the ground thoroughly, but shallow. If nothing better is at hand, use a double-shovel or a two-horse cultivator. The strip in the row between the plants should be stirred by hand with a hoe. They should be plowed and hoed every ten days, or oftener, all spring and summer, or until the first of September. It is less trouble to plow and hoe three times when not weedy than once after they have become foul with weeds; so don't be afraid of plowing and hoeing too often. Especially should the soil be stirred as soon as it is dry enough after each heavy rain. Pick off all fruit stems the first season, and by training the runners along the rows cause the spaces between the plants to be filled up first with the new ones, and then gradually allow the rows to get wider until they are 15 or 18 inches wide, and plants about three or four inches apart in the row. All plants in excess of this should be destroyed. Plants may be made to root just where wanted by putting in position and putting a clod or a little soil on them to hold them there. Never allow weeds or grass to obtain a foothold in a bed, but keep it clean and loose at all times.

MULCHING.

About the first of December each year strawberries should be mulched with old hay, leaves, straw or other light material. This should, in all cases, be free from seeds of weeds, grass, etc., if possible, and should be put on quite thick between the rows, and just thick enough over them to barely hide the plants. In the spring, if from any cause the mulching is so thick over any portion of the bed that the plants cannot readily get through it, it should be raked back a little; otherwise they may be smothered out and lost. If berries extra large and fine are desired, scatter old, fine manure in among the plants before mulching them in the fall.

As soon as the berries are all picked plow under the whole bed, mulch, plants and all, and on it plant some late crop, as potatoes, cabbage, etc., and meantime have another bed of berries coming on that was put out in the spring, just as the first one was. Plants may be taken from the bearing bed to set the new one with.

VARIETIES.

Only a few varieties are needed, and these should be early, medium and late, so as to extend the season as much as possible. No one can tell certainly which varieties will succeed best on his soil, and with his treatment, without first trying them; but some varieties succeed so generally, and under such different circumstances, that one is quite safe in trying them. Among those varieties that will probably succeed anywhere in the State of Missouri are Crescent Seedling, Warfield, Charles Downing and Cumberland; and every one should try the Gandy, which is the finest late variety, and which has already been successful nearly everywhere. These varieties will give one plenty of fine berries anywhere in the State; and, while they may not all be the best for any given locality, they are all safe for a farmer to plant, and after better varieties, specially suited to each locality. market or mode of treatment, are found, these may be discarded if no longer wanted. Many other varieties are good, and in some hands might be better than some of the above, but it is not best for one to try too many at first.

It should be borne in mind that what I have written above is not intended for the professional grower, but is intended to be addressed rather to the vast number of farmers in the State of Missouri who do not raise their own berries. If this shall be the means of inducing even a small portion of them to raise for their families all the beautiful, luscious, health-preserving and life-giving strawberries they can use, and thus add to their happiness and welfare in this life, I shall feel amply rewarded for the effort put forth in this production.

Mr. Russell encloses to me with his article on "Strawberries for Farmers" the following clipping in relation to the strawberry industry at Sarcoxie:

The Sarcoxie Horticultural Association was organized November 20, 1890, with about 20 members. Now it is a flourishing organization with 53 members on its roll. Its members have made strawberry growing a specialty. In 1891 they shipped 14 car-loads of berries; in 1892, 12 cars; in 1893, 9 cars; in 1894, 11 cars, and they have bought and made up about 26,000 berry crates, or enough from the crop of 1895 to load 52 cars.

The picking alone next spring will cost $9000, and will take 2500 hands to pick the berries, besides the hands it will take to crate the fruit and teams to haul them to the cars.

The members of the association are all wide-awake horticulturists, and deserve credit for the amount of money they bring to our town every year. The officers are: President, J. M. Davidson; vice-president, John Johnson; treasurer, J. W. Osborn; secretary, Henry Adkins. Its managers or shipping committee are Henry Adkins, J. M. Davidson and J. L. Carnahan.

Hog Cholera and Swine Plague.

Read at the Swine Breeders' Association at Chillicothe, Mo., January 9, 1895.

By John S. Meyer.

Mr. President, Ladies and Gentlemen—I have been requested by the Secretary of the State Board of Agriculture to be present at this meeting and give an address on some of the diseases of swine. For this occasion I have selected the subject of hog cholera and swine plague. These two diseases are very destructive to the pachyderm species of the United States. It is estimated that the losses from these diseases reach from $10,000,000 to $25,000,000 annually. Every one acquainted with the raising of hogs knows how disastrous these contagious diseases are. Owing to the resemblance of the two diseases, and the impossibility of distinguishing between them, except by scientific investigation, it is impossible to say what portion of this loss should be ascribed to one disease, and what to the other. Both diseases are known to be common, and spread by infection. Hog cholera is particularly fatal to young pigs, and often attacks them when the older ones escape. I have personally seen such outbreaks where the young pigs all died, with the exception of one or two, while the older ones had either mild attacks or apparently escaped the disease altogether.

It has been proven by the research of the Bureau of Agriculture that the older animals have a greater power of resisting the virus than the younger ones. This power of immunity is also contributed to those that have passed through an attack, which is proven in this way: If hog cholera breaks out among a herd of swine, and is checked and apparently eradicated by medical or thorough hygienic measures, the hogs thus saved are capable of resisting the contagion on the premises, while purchased hogs, that have not been exposed, will, when put with the exposed or recovered ones, contract the disease and die. This shows that the virus has remained upon the premises, and the hogs have been saved, not by the destruction of the contagion, but by keeping the infected hogs alive until they become immune. This is an important fact, and one that should be kept constantly in mind in applying measures of prevention. The virus of hog

cholera is very tenacious, more resisting to the conditions which affect the vitality of bacteria than that of swine plague, and it is also more easily spread and communicated to healthy animals.

Swine contract hog cholera by taking the virus into the body with drinking water, inhalation of the air, and occasionally through flesh wounds. On the other hand, the virus of swine plague is generally, if not always, contracted by inhalation. The incubation period varies from four to twenty days. During this period the germs are multiplying, slowly and gradually overpowering the vital powers of the animal.

Spmptoms. These you are all possibly too well acquainted with to need description. Usually the first thing seen is a cough, although this is not always present. Again, one or more will seem stupid, do not care to leave their beds, shivering, unwillingness to move, more or less loss of appetite; they have a tendency to hide away in their bedding, love of cold drinks, slow and difficult walking, ears hot and sore, eyes sunken and watery. There is usually constipation or bloody diarrhœa. The breathing is more rapid than usual, and may be oppressed and labored in the later stages. The skin has a peculiarly pinkish red or purple appearance. There are sometimes eruptions on the skin which leave crusts or scabs of various sizes. There is rapid loss of flesh, tottering gait, when finally the pulse becomes imperceptible, the victim is stretched out, and gives occasional convulsive movements and expires.

Post-mortem. The germs of hog cholera have a habit of collecting or growing in clusters in the blood vessels, which leads to the plugging up of the smaller vessels. This causes red spots where the blood leaves the vessels and collects in the solid tissues. These spots are referred to as congestions or extravasations of blood. They are common in hog cholera. In swine plague the bacterias are evenly diffused through the blood, never forming plugs. The spleen is generally enlarged from two to four times its normal size, is soft and engorged with blood. The blood extravasates frequently into the lymphatic glands, and particularly along the intestines, on the surface and in the substance of the lungs and kidneys, on the mucus surface of the stomach and intestines. The contents of the intestines are sometimes covered with clotted blood. In the chronic form of the disease the spleen is rarely enlarged. The lymphatic glands of the affected intestines are enlarged and tough. In the more acute cases lung lesions may be found, varying from collapse and œdema of the lung tissue to broncho-pneumonia. In swine plague the lungs are often found inflamed and to contain large numbers of small points. These spots are known as necrotic foci.

Inflammation of the serous membrane is common in hog plague, and this may be found affecting the pleura, pericardium and peritoneum, accompanied with fibrinous, inflammatory deposits on the surface of these membranes. In hog cholera the first effect of the disease is believed to be upon the intestines, with secondary invasion of the lungs. In swine plague the first effect is believed to be upon the lungs, and the invasion of the intestines a subsequent process. Briefly reviewing these changes, we find that the most characteristic lesions of hog cholera consist of: First—Hemorrhages, particularly in the subcutaneous, submucous and subserous connective tissues, in the lymphatic glands and in the various organs of the body. Second—Ulceration of the large intestines. Third—Collapse of lung tissue, and less frequent by broncho-pneumonia.

The most characteristic lesions of swine plague are: First—Inflammation of lungs, numerous small necrotic points in these organs, or a few large cheesy masses. Second—Inflamation of serous membranes, with fibrinous deposits. Third—Congestion of mucous membrane of intestines, or inflammation of same, with fibrinous deposits.

Notwithstanding this clear difference in typical cases, there are many outbreaks where it is difficult to make a diagnosis, even after post-mortem examination, because both diseases may be affecting the same animal at the same time, or the changes may resemble both diseases without being very characteristic of either. In such cases it is only by microscopic examination and cultivation of the germs that a reliable diagnosis can be made.

Causes. Both hog cholera and swine plague are caused by bacteria. Hog cholera bacteria, when inoculated in minute doses, are fatal to mice, rabbits and Guine pigs; in large doses may kill pigeons. Swine plague germs are fatal to these animals, and also to fowls.

Hog cholera may be produced experimentally: First, by exposing well hogs to diseased ones; second, by feeding the internal organs of diseased carcasses, or cultures of the germs.

Swine plague may be produced experimentally: First, by cohabitation; second, by injection or inhaling virulent germs into lung tissues. Both diseases are produced by injecting cultures of the respective germs directly into the blood-vessels. From the results of experiments with these diseases it has been concluded that the germs of hog cholera find their way into the bodies of swine with the food and drink, and with inspired air.

Hog cholera germs are very hardy and vigorous. They are able to live a long while in the water of ponds and streams. They may live in the soil for at least three months, and in accumulations of straw

and litter for a much longer time. They withstand drying and other adverse conditions in a remarkable manner. The swine plague germs, on the contrary, are very delicate and easily destroyed. They soon perish in water or by drying. The temperature for their growth must be more constant, and every condition of life more favorable than is required for hog cholera germs. The hog cholera germs are not usually present, and must be introduced before the disease can be developed. The swine plague germs are most always present, and acquire sufficient virulence by encountering proper conditions on one farm to spread to adjoining farms in the same manner as hog cholera. There are practically the same conditions to guard against in the prevention of the two diseases.

Diagnosis.—The first question that occurs to the owner of swine when diseases appear among his animals is, What is the disease with which they are affected? If several animals are affected with the symptoms already enumerated, and if the same disease had been affecting hogs on neighboring farms, we may decide that one or both of the diseases in question are present, since no other epizootic disease has been recognized in this country. If, on examining the carcass after death, projecting button-like ulcers are found in the large intestines, we know that hog cholera is present. It must be remembered that these ulcers are not found in the acute cases, but in the sub-acute and chronic form, where life is prolonged a sufficient time for them to form. If there is inflammation of the lungs, and if cheese-like masses are found in the substance of these organs, the disease is probably swine plague. Small blood-spots in the tissues, or scattered over the internal organs, indicate hog cholera, while inflammation of the serous membranes indicates swine plague.

Prognosis.—The loss which results from outbreak of hog cholera and swine plague depends partly upon the condition of the hogs: that is, upon their susceptibility to the disease, and partly upon the virulence of the contagion in the particular outbreak. If the animals are very susceptible and the contagion very virulent, the loss in even large herds may reach 90 to 100 per cent in those cases where the disease is allowed to run its course. In milder outbreaks, or with animals more capable of resisting the contagion, the losses vary from 20 to 60 per cent. Toward the end of an outbreak a larger proportion of animals will recover than at the beginning. A portion of those recovering will fatten, but others remain lean, stunted in growth, or never become healthy animals.

Treatment.—With all diseases of this class, prevention is cheaper and in every way more satisfactory than medical treatment. The great

aim of the people should be to prevent the spread of infectious diseases. A remedy which will cure in every case is not expected. There has never been discovered a remedy for a single one of the infectious diseases of man or beast which will cure every individual attacked. Some forms of these diseases are so violent and rapid that the animals are dead before they are observed to be sick. Under such conditions the treatment should be confined to the apparently well animals. In many outbreaks the type of the outbreak is not so violent, and there is time to treat the sick animals, also the whole herd, after some members have shown that they are diseased. The latest experiments indicate that treatment, if properly applied, may be successful. The most efficient formula which has been tested by the Board of Agriculture is the following:

Wood charcoal, 1 lb; sulphur, 1 lb; sodium chloride, 2 lbs; sodium bicarbonate, 2 lbs; sodium hyposulphate, 2 lbs; sodium sulphate, 1 lb; antimony sulphate, 1 lb.

These ingredients should be completely pulverized and thoroughly mixed. The dose of this mixture is a large tablespoonful for each 200 pounds weight of hogs to be treated, and it should be given once a day. When hogs are affected with these diseases they should be fed on light and easily digested foods, changing the food often. Animals that are very sick should be drenched with the medicine shaken up with water. Do not turn a hog on its back to drench it. This medicine may be used as a preventive of these diseases. For this purpose it should be put in the food of the whole herd. Care should be taken to see that each animal gets its proper portion. Success or failure with this remedy depends largely upon the manner in which it is given. If it is improperly administered, or the hogs left out in cold storms and compelled to remain day and night in mud six inches or a foot deep, under the necessity of searching through this mud to find an ear of corn in order to get something to eat, the farmer might as well save his money and let his hogs die. To treat these diseases successfully, the animal should be kept dry and comfortable, with plenty of fresh air, but no drafts.

Sanitary Measures.—When hogs are first found to be affected with these diseases, the lot or pens should be disinfected by dusting plentifully with dry air-slaked lime, or by sprinkling with a 5 per cent solution of crude carbolic acid. The animals should all be removed to new disinfected quarters. If possible, the sick and apparently well should be separated before they are moved, and then put into different lots. Thoroughly disinfect these lots once or twice a week, and keep the hogs from stagnant water. By this treatment the hogs gain a

marked degree of immunity. When new hogs are brought upon a farm, or when his own return from an exhibition, they should be kept in quarantine, and not allowed to come in contact with other hogs for at least six weeks. When hogs which have gone through an outbreak are apparently well and thriving, new hogs added to the herd are liable to be attacked. For this reason five or six months should be allowed to pass before any new hogs are purchased and brought on the premises, or before any are sold to be put among other lots of hogs.

Hogs should not be allowed to run at large in the vicinity of railroads over which swine are transported. When these diseases appear on a farm, precautions should be taken to prevent the spread of the contagion. No one should go upon the fields or into the pens where the sick animals are, and then go to another farm where the disease has not appeared. Experience shows that hogs kept up in pens, or in a small lot, are less subject to infection when cholera is in the neighborhood than those which are allowed to run at large in the fields. A small quantity of carbolic acid (three to fifteen drops, according to age) in the drinking water tends to prevent infection, and may have a beneficial influence upon the course of the disease.

Hoping my hearers may gain a few profitable points from these remarks, I will leave the subject for your further digestion.

Indigestion.

By Dr. John S. Meyer, St. Joseph.

Mr. President, Ladies and Gentlemen:

I am sent here by the State Board of Agriculture to represent the State Veterinary service, and the subject I shall address you on is indigestion in some of our domesticated animals. We have indigestion in two forms, acute and chronic. We have various definitions of the word. Among them are these: With difficulty to digest; a failure of natural changes which food undergoes in the alimentary canal; difficult or painful digestion; though the meaning of them all is about the same.

Acute indigestion results from engorgement of the stomach with food, from imperfect mastication, and from the ingestion of indigestible material, or food specially apt to undergo fermentative changes, sudden changes of food, irregular or over-feeding, too long fasting and food then given while the animal is exhausted; new hay or grain, large quantities of green food, large drinks of cold water when the animal

is warm; cooked food, brewer's grain. Wheat and barley are also very likely to induce indigestion. They also frequently cause purgation or laminitis, commonly known as "founder," and may even lead to a fatal result.

The seat and causes of indigestion are found to vary in different horses, or even in the same horse at different times. Apart from the indigestibility of the food itself, there are many causes productive of indigestion. The teeth are often at fault. Where these are sharp, irregular or decayed, the food is imperfectly masticated and swallowed before there is a proper admixture with the saliva. Bolting of the food. The bile secretion of the liver may be defective in quality and quantity. There may be lack of the secretion of the pancreatic juice, or there may simply be want of peristaltic movement of the stomach and intestines, thereby causing an interruption of the passage of the ingesta. The principal seat of indigestion, however, is in the stomach or small intestines. Whenever, from any cause, the secretions from these parts are excessive or deficient, dyspepsia or indigestion must invariably follow. Indigestion is often due to keeping stock on low, marshy pastures, and particularly during cold weather; wintering on hard, dry hay or corn-stalks, and other bulky and innutritious food.

The symptoms of acute indigestion are sudden in their onset. These is a fullness of the abdomen, and the horse is restless and shows indications of colicky pain. He lies down and rises again alternately and paws the ground with his fore feet. Eructions of wind, occasional discharge of saliva from the mouth, and tremors of the superficial muscles, are also among the symptons of acute indigestion. In severe cases the pain is very acute, and the horse throws himself about wildly, and frequently looks toward his flanks. The pulse and respiration are accelerated, and in some instances there are attempts at vomiting, and the discharge of brown fluid contents of the stomach with the eructions. In some instances there is no manifestation of gastric pain, but the horse remains dull and semi-comatose, and the breathing may become stertorous; he refuses his food, is moved with difficulty, and attempts to press his forehead against a wall or tree, or anything which comes in his way. Under these circumstances the respiration is not much quickened, and the pulse is of full volume, but not so accelerated as when gastric pain is a prominent sympton. Such cases as these were spoken of by the old writers as stomach staggers, and seem to be comparable with the form of gastric disturbance in man which is attended with vertigo and flatulent dyspepsia.

In these acute cases treatment must be prompt and to the point. One of the first medicines given should be a dose of raw linseed oil

or Epsom salts, from one to two pints of oil, or one to one and a half pounds of salts. Then follow up with a good warm, stimulating drench. If there is much flatulency, you can give one ounce each of aromatic spirits of ammonia and Jamica ginger, with one-half pint of good whisky in one-half pint of warm water.

Chronic indigestion, like the acute form, is chiefly caused by dietetic errors, though these are not always apparent. Sometimes the food, though of good quality, is too stimulating and dry; in other cases it is not sufficiently masticated, perhaps owing to irregularities or sharp teeth; but in most cases it will be found to be of inferior quality or administered irregularly. Want of exercise predisposes to this disease. Food which possesses astringent properties and tends to check secretion may also act as an exciting cause. It is very likely to appear toward the end of protracted seasons of drouth; therefore a deficiency of water must be regarded as one of the conditions which favor its development. Cases may sometimes occur where the causes cannot always be explained. Dietetic errors, in their turn, induce changes in the gastric juices and in the movement of the stomach, which, however, are sometimes deficient from impaired nerve power.

The symptoms of this affection are very variable. The appetite may or may not be impaired; sometimes it is capricious and perverted; in other cases, though, it continues good. The animal still continues to lose flesh; the bowels are generally irregular, the fæces often coated with mucus, and there may be great thirst and acid eructions. Abdominal pain is not infrequent in severe cases, especially when the appetite remains unimpaired. The appetite is not only irregular in some cases, but is often depraved. There is a disposition on the part of the horse to eat unusual substances, as wood or soiled bedding clay, etc. The bowels are irregular; today, loose and bad smelling; tomorrow, costive. Grain often passes whole in the fœces, and the hay passes in balls or impacted masses, undergoing but little change. The horse frequently passes considerable quantities of wind, that has a sour, fœtid odor. The animal loses flesh; the skin presents a hard, dry appearance, and seems very tight (hide-bound). The horse is weak, sweats easily and soon becomes emaciated.

Treatment.—The cause of the disorder should first be looked after, and the dietetic arrangements carefully regulated. We must commence with the food, its quality, quantity and time of feeding. Examining the water supply, and seeing that it is fresh and of good quality; besides, that it is given before feeding, as water taken after a meal is eaten washes the contents of the stomach into the bowels before it has been thoroughly prepared for their reception. Endeavor to locate

the trouble, whether it is in the stomach, intestines or annexed organs of digestion, as the liver, pancrease, etc. If it is the teeth, they must be attended to. If sharp and irregular, straighten and dress them smooth with a tooth rasp. If ulcerated or decayed, remove with forceps. If indigestion is due to ravenous eating or bolting the food, we must then correct this by feeding in a large manger, where the grain can be spread and the horse compelled to eat slowly. The bowels should be kept open by giving soft foods, and when necessary should give vegetable tonics, as pulverized gentian in one or two teaspoonful doses, mixed with pulverized quassia, and bi-carbonate of soda in the same sized doses. When acidity of the stomach is a marked symptom, such anticides as pulverized chalk or subnitrate of bismuth may be administered in half to table-spoon doses. The best and most rational treatment is removing the cause and thorough dieting before the animal gets too weak, as one ounce of prevention is worth many pounds of treatment.

If my hearers will gain a few points from these remarks, I shall feel that my time has not been idly spent.

Azoturea.

By Dr. John S. Meyer, St. Joseph.

This is a diseased condition, characterized by tonic or clonic spasms of the large muscles of the posterior part of the body and of the limbs, and by the elimination of nitrogenous, darkly-colored urine, of high specific gravity.

Like diabetes, this is a disease of the liver and blood-forming functions more than of the kidneys; but as the prominent symptoms are loss of control over the hind limbs and the passage of ropy and dark-colored urine, the vulgar idea is that it is a disorder of the urinary organs. It is a complex affection, directly connected with a plethora in the blood of nitro-organized constituents, with extreme nervous and muscular disorder, and the excretion of a dense reddish or brownish urine. It is directly connected with high feeding, especially on highly nitrogenized food (oats, beans, peas, cotton-seed meal, brewer's grain, etc.), and with a period of idleness in the stall under full rations.

This disease is never seen at pasture, rarely under constant daily work, even though the feeding be high; and the attack is usually precipitated by taking the horse from the stable and subjecting it to

exercise or work. The poison is not present when taken out of the stable, as the horse is likely to be noticeably lively and spirited, seemingly feeling unusually well; but he will usually succumb under the first hundred yards or half mile of exercise. Azoturea is the result of an over-supply of excess of proteins while the animal is at rest, which causes an attack when exercised. The attack is supposed to be more common in autumn, but is likely to occur at any season of the year.

Symptoms.—The symptoms of azoturea usually come on suddenly, without any previous warning or indication of disease. Horses may be attacked when in the stable, or, as more commonly occurs, when they have traveled a short distance after a period of rest. In the latter case they become suddenly lame, or have such difficulty in moving the limbs, generally the hind ones, that they are scarcely able to move. In some cases they are, as it were, struck down suddenly from loss of motor power in the posterior extremities. In other instances the attack is not so sudden; the animal becomes very restless, perspires freely, and shows a disposition to lie down; and very shortly the characteristic symptoms appear, if not already present. The muscles of the loins or haunches (gluteal muscles) become swollen and rigid, the subject moves stiffly or unsteadily, crouches behind, the limbs being carried semi-flexed, and he soon drops, unable to support himself. The perspiration is usually excessive. When down, the body and limbs are moved convulsively, but there is no power or co-ordination of movement in the muscles. The pulse and breathing are accelerated, the eyes red with a tinge of brown, and the urine, if passed, is seen to be highly colored, dark brown, red or black, but it contains neither blood-clots nor globules. The color is mainly due to hæmglobin and other imperfectly elaborated constituents of the blood.

It may end fatally in a few hours or days, or a recovery may ensue, which is usually more speedy and perfect if it has set in at an early stage. In the late and tardy recoveries, a partial paralysis of the hind limbs may last for months. A frequent sequel of these tardy cases is an extensive wasting of the muscles leading up from the front of the stifle (those supplied by the crural nerve), and a complete inability to stand. In the milder forms this affection may appear as a lameness in one hind limb, from an indefinite cause, succeeding to some sudden exertion, and attended by a dusky brown color of the membranes of the eye and nose, and some wincing when the last ribs are struck. In other instances, again, the severe symptoms abate; but the animal does not regain the use of its limbs; although it may

eat well and be perfectly conscious, it is unable to rise, and eventually dies from some complication.

In favorable cases the urine gradually becomes normal, the spasms gradually lessen in severity, the power of movement returns, and in a few days the animal is convalescent. In other cases, for a long time the loss of power in certain muscles remains. Neither is there recovery in all cases when the urine becomes normal, for the cerebral complications may still continue, and death ensue in consequence.

There is general congestion throughout the body, especially in the glands of the abdomen. The nerve centers may be more or less hyperæmic, and the blood is found to be dark and semi-fluid. The prevention of this serious affection lies in restriction of the diet, and giving daily exercise when the animal is not at work. When a horse has been condemned to absolute repose on good feeding, he may have a laxative (one-half to one pound Glauber salts) and have graduated exercise, beginning with a short walk and increasing day by day.

The Treatment—In mild cases may consist in a laxative, graduated daily exercise and a daily dose of saltpetre (one ounce). In sudden attacks, wrap up well with blankets and encourage profuse perspiration, keeping the patient as quiet as possible. If possible, give bromide of potassium in 4 drachm doses to keep animal quiet, and try and send for a practitioner, as there is no time to be lost in these severe cases, and the professional man will have his hands full to bring these cases through.

I hope that this may be of benefit to some of my friends, and enable them to understand a disease they are liable to come in contact with at any time, and that it may be the means of saving some of our faithful dumb brutes.

The Best Breed of Turkeys for the Farmer to Raise.

By Mrs. Nannie Todd.

I think the Bronze is the best breed of turkeys for the farmer to raise. It is the largest, healthiest, handsomest, most active and industrious of all breeds. This breed ranges all over the farm, catches all the grasshoppers and all other kinds of insects.

Contrary to the usual course of nature, the turkey has not improved by domestication. Breeders, therefore, thought it best to cross the Narraganset breed with the wild turkey, and it is generally supposed that the Bronze turkey is the result of this cross. The infusion of the wild blood has produced a larger animal than the wild

turkey; has given him the strength, vitality and free spirit of his wild ancestor, so that he will range over your own farm, and even that of your neighbor, without invitation. They are, however, more gentle than the smaller bird, being less timid.

The Bronze turkeys will live where others would starve. Some object to them on account of their large growth, and many of them are indeed immense, a pure-bred three-year-old mammoth gobbler sometimes weighing as much as fifty pounds. They grow very rapidly, however, and will bring the same price per pound as any other turkey; so that a flock of twenty-five will require even less food and bring from 25 to 75 pounds more in weight than any other variety of the same age. Flocks, however, vary in size.

The Bronze is a symmetrical, stylish bird. The neck, breast and wing-bow are a rich bronze, with a bronzy-red reflection as they move in the sunlight. The breast feathers should have a narrow lacing or edging of gray. The back is somewhat darker in color, as it shows a narrow black band across the feathers. A rather long, black tail, with narrow bands of light brown across the feathers, and terminating in a broad black band, with an edging of dull white, adds greatly to the beauty of a bird. If the stock is pure to start with, no amount of careless or unskillful mating can deprive them of their beauty.

The Bronze hen will set two or three times in one season. No breed can excel them in eggs. I have known of their laying till Christmas when the weather was pleasant.

The royal blood can always be discerned from their scarlet heads, pink-tinted legs, and long, straight toes. The shank and toes of the male should be a nice pink in color and of medium height, as a short-legged bird never makes a large one.

So undoubtedly has the Bronze turkey proven himself the superior of other breeds that the subject needs no further discussion. Every year I am more fond of my Bronze turkeys, and they seem more beautiful to me.

FIFTH ANNUAL MEETING

OF THE

MISSOURI

STATE DAIRYMEN'S ASSOCIATION

HELD IN

Higginsville, Mo., November 26-28, 1894,

In Coöperation with State Board of Agriculture.

KIDDER, Mo, March 27, 1895.

Hon. J. R. Rippey, Sec'y Mo. State Board of Agriculture,

Columbia, Mo.:

DEAR SIR—Herewith I send you a report of the fifth annual meeting of the Missouri State Dairy Association, held November 26, 27 and 28, 1894, in Higginsville, Mo.

Respectfully,

LEVI CHUBBUCK, Sec'y.

OFFICERS FOR 1895.

President—JOHN PATTERSON. ..... Kirksville

Vice-President—WM. BRUNS ..... Concordia

Sec'y-Treas.—LEVI CHUBBUCK. ..... Kidder

PROCEEDINGS.

By invitation from the dairymen of Lafayette county and citizens of Higginsville, members of the Missouri State Dairymen's Association assembled in the court-house in Higginsville November 26, 1894, for the fifth annual meeting.

Acting President John Patterson called the meeting to order for the first session at 7:30 p. m., and after music by the band, and prayer, introduced Major H. C. Schwartz, who delivered the following address of welcome:

Mr. Chairman and Members of the Missouri State Dairy Association:

In the name of the good citizens of Higginsville, I bid you a most hearty welcome. Higginsville, yes, all of Lafayette county, is inhabited by an industrious, intelligent and progressive class of people, and while all conventions held for a good purpose should be welcomed here, yet the annual convention of the Missouri State Dairy Association is especially welcomed and appreciated here, for the instruction and information it will impart to our citizens must be productive of much good. If Lafayette county has been by nature adapted for any one purpose, that purpose must be the production of sweet cream and sweet, delicious and yellow butter. Our blue-grass fields compare favorably with the most famous blue-grass regions of old Kentucky. We have plenty of good wells and springs of cool and living water. Our creeks and brooks are lined with sheltering timber to give cooling shade to milch cows during the summer heat, and give shelter and protection against the chilling, icy blasts of winter.

But what is true of Lafayette county is also true of the State of Missouri. There is no good reason why Missouri should not occupy the first place among the butter-producing states of the Union. Missouri is centrally located, both as to population and to territory. We are close to the markets of three of the largest cities of the United States. Our climate is suitable for the dairy business. We are seldom visited by long and protracted drouths, so detrimental to the dairy industry. Our State is crossed by rivers, streams, creeks and brooks almost in every direction, thus affording plenty of cool and clear water. We have enough of timber for shelter and shade and to give us cheap lumber for stables and stalls. Besides, we have to look around to find a substitute for our wheat industry. Our land is too high-priced to raise wheat at 30 or 40 cents per bushel, and there is no hope for much improvement in this line. The endless plains of South America and Southern Russia can supply all the wheat for the markets of Europe, and in the future we will be cut off from the European wheat market, for on account of our labor cost we cannot compete with these countries.

Corn is still king, but most of our land has been in cultivation too long to be continually put in corn, and we have to change our ground with some products that will act as fertilizers, and we all know meadows and pastures and clover fields will restore the original fertility of the soil, and at the same time will give us the very best of feed for milch cows for both the summer and winter seasons. So the dairy business would serve the double purpose of giving us a profitable industry and fertilizing our land and making it more valuable. When we consider that it takes no more corn and other feed to produce a pound of butter than it does to produce a pound of beef, and that butter sells from 15 to 25 cents per pound and beef only from 3 to 10 cents per pound, we see at once that the difference in the price of the two articles is enough to make up for the additional labor cost required for making butter.

For dairy purposes almost every foot of land in our State could be used. With proper care and attention the wild hills of Warren, Gasconade, Franklin and Osage counties, would bring as rich, tender and succulent grass as the famous Alpine hills of Europe, and there is no reason why Missouri cheese and butter should not one day become as famous as the butter and cheese of Switzerland. With all our land utilized, Old Missouri would support hundreds of thousands of additional milch cows, and our hills and valleys would echo and re-echo with the ringing of cow-bells and the lowing of gentle herds of dairy cows.

But you will say that thereby we would overload the market and would reduce the price of butter so much that the dairy industry would no longer be profitable. But this is only partly true. Good butter will always make a market for itself. We all know if we happen to find and buy a pound of real sweet and delicious butter, it will not last one-half as long on our table as will a pound of strong and bad butter. If there is any food of which people will always buy the best on hand, it is butter. If from now on only good butter would be put on the market, the consumption of butter would more than double in one year. All merchants know that their customers will often call for good butter, and if on hand, they will buy, but if all is old and strong they will not buy any, and when the market is crowded with butter it is always the poorer and cheaper article that stays on hand.

These annual meetings of the State Dairy Association can therefore not be too highly appreciated, and all the butter-makers of the State should attend them and should gain all the information in the art of making good butter that can be had. The profit of the butter-maker depends more upon the quality than upon the quantity of butter put upon the market. It takes no more milk or cream to make a pound of good butter than to make a pound of bad butter, while the former will bring twice as much money as the latter.

Another proof that our market is not fully supplied with good sweet butter is the fact that hundreds of thousands of pounds of oleomargarine are annually consumed in this country. The people of the United States are said to be the greatest butter-eaters in the world, and if they cannot get good butter they will eat something that tastes like it. But we all know that if the people could always find sweet delicious butter they would not eat oleo. Pure butter is said to contain a hundred per cent of nourishment, while oleo does not contain any for an ordinary stomach, for chemists and scientists tell us that the lard and tallow of which oleomargarine are made is mixed at so low a temperature that the human stomach is unable to dissolve it; so that while butter is a good and wholesome food, oleo is detrimental to our health. So that if all butter-makers would do their duty and put only good butter on the market, and if the people would attend these association

meetings and learn the difference between butter and oleo, there is no reason why butter should not hold its own in the temperate zone.

Down in the hot and tropical countries it is very difficult to get butter in good condition, and there oleo is becoming a very dangerous enemy to butter because oleo keeps better. In these hot counties the consumption of butter is said to have decreased over 40 per cent since 1884, but it seems to me that this market could be regained for butter by canning it as we can fruits and vegetables.

If we remember that the oleomargarine manufacturer buys his lard and tallow from five to eight cents per pound, we see that he gets his raw material cheaper than the dairyman gets his milk or cream, and the honest butter-maker needs some protection by law. We have a law in Missouri that forbids the manufacturer of oleo to ship his goods except by marking the boxes that contain them "oleomargarine" or "butterine." This law is, however, too easily violated. Oleo tastes like butter, and if it looks like butter it takes an expert to distinguish the one from the other. A hotel-keeper might keep oleo, in its present color, on his tables and not know it, or a retail merchant might order butter and receive oleo and not know the difference. So why not give oleo the original color of lard or tallow? There is nothing distasteful or disagreeable about a pure white color. Give oleo some other color than the butter color. Let each article stand on its own merits.

John Patterson responded in his quaint but effective Swedish-American style, which—while it made the audience smile now and then—commands strict attention by its sharp wit and common-sense practical drift. He explained that the trouble was that the Missouri farmers did not like to sit down to milk; they cling to beef. We must keep our sons from going to the cities, from whence they but too often return not much better than they went. The same is also often the case with the old man who left the farm to take a store and dress up his family in city style—they were only too glad to return to the farm, if it was not sold. With intelligent dairying there is no need of leaving the farm. There is money-making work for the whole family, and the soil will be improved instead of impoverished by continual corn and wheat-growing. He gently reproached the mayor for the remark about the "sheltering" trees.

The secretary, Mr. Levi Chubbuck, then read his report, as follows:

MR. CHAIRMAN: The Missouri State Dairy Association was four years old this fall. Let us review its history a little, examine its present condition and look as far as w emay into the future, so as to determine, if possible, whether or not the organization is meeting or promises to meet the hopes of those who were instrumental in bringing it into existence.

During September, 1890, the writer, then Secretary of the State Board of Agriculture, believing that the intent of the law creating and governing the board of agriculture was that said board should encourage the development of all lines of farming that promised a measure of prosperity to those who would engage in it, and, incidentally, be bene-

ficial to all the people, issued a call to the dairymen of the State to meet him in Kansas City at the exposition building September 24, 1890, for consultation as to the best means and methods for the advancement of the dairy industry. The result of the call was that twelve men met, and, after discussion, decided to organize a State Dairy Association. The names of these twelve men should be remembered by the dairymen of Missouri. They are B. O. Cowan, Charles W. Murtfeldt, W. H. Lewis, Charles A. Adams, A. Uhlman, J. M. Smith, G. W. Hicks, D. Heiny, H. N. Halderman, J. W. Shivel, J. H. Hill and M. V. Lawson.

Mr. Cowan was chosen to preside at the meeting and Mr. Murtfeldt was asked to act as secretary. A temporary organization was effected by electing Mr. William Lewis president and J. M. Smith secretary, and a meeting for permanent organization fixed for January following at Jefferson City. A committee on articles of association was appointed as follows: J. L. Erwin, J. M. Smith and Levi Chubbuck.

President Lewis was appointed a delegate to attend the next meeting of the Nebraska State Dairy Association.

On the discussion of the means and methods, the speaker outlined the work and purpose of the State Board of Agriculture, and stated that a leading feature of the next series of farmers' institutes to be held by the board would be the discussion of the dairy industry. Of this we will speak further later on.

FIRST ANNUAL MEETING.

Pursuant to action taken at the preliminary meeting, the Missouri State Dairymen's Association met in Jefferson City January 15, 1891, for permanent organization and first annual meeting.

The committee on articles of association submitted a report in the form of a series of articles, which were adopted, after which action permanent officers were elected, as follows: J. L. Erwin, president; W. H. Lewis, vice-president; A. Uhlman, treasurer; J. M. Smith, secretary.

At that meeting was taken the first step toward legislation in the direction of pure butter, by the appointment of a committee to present the matter to the Legislature then in session.

Also the desirability of having a State Dairy school for the practical education of dairymen was discussed, and a resolution was adopted asking the Legislature to provide such facilities in connection with the State Agricultural College as would allow the establishment of a dairy school in connection therewith.

Mr. J. H. Monrad, then of Chicago, now editor of "The National Dairyman", Kansas City, spoke of the World's Fair, for which prepa-

rations were then being made, and of the importance to Missouri of being well represented there. The association resolved to ask the legislature to appropriate $100,000 with which to secure a proper display of dairy and other agricultural products at the Columbian exposition.

I will speak later of the portion of the $150,000 that was appropriated that Missouri dairy interests did get.

J. Y. Sawyer, of Chicago, exhibited the Babcock milk tester, which had then recently been invented.

The list of members was then increased from twelve to twenty-five, and included three ladies.

The secretary was directed to prepare a report of this and the preliminary meeting, and furnish the same to the secretary of the State Board of Agriculture for publication in the twenty-third annual report of the Board. This was done, and in addition to publishing the dairy proceedings in the report of the Board, 1000 copies were printed in separate pamphlet form and distributed to the dairymen of the State. This pamphlet of sixty-five pages contains, besides the proceedings of the dairy meetings, reports from creameries, papers on dairying and other dairy matters.

SECOND ANNUAL MEETING.

February 9 and 10, 1892, the association held its second annual meeting in Sumner, Mo., under the auspices of the State Board of Agriculture.

Previous to the date of the meeting, Mr. Smith had resigned as secretary and S. G. Lewis was appointed temporary secretary by President Erwin. There was on that occasion an exhibit of butter and cheese, dairy utensils and butter color.

The Hon. J. K. Gwynn, Executive Commissioner of the Missouri World's Fair Board, was present by invitation, and addressed the meeting. The association resolved to make a proper display of dairy products at the World's Fair, and asked that a specified sum be set apart from the appropriation for this purpose.

By resolution, Congressman Hatch was thanked for his efforts to prevent imitation products being sold as pure butter.

The number of members had increased at that time to forty-four. The officers elected were: J. L. Erwin, president; John Patterson, vice-president; B. M. Campbell, treasurer; S. G. Lewis, secretary.

As had been done the previous year, the State Board of Agriculture published the proceedings in the twenty-fourth annual report of the Board, and in separate pamphlet form 1000 copies.

THIRD ANNUAL MEETING.

The third annual meeting of the association was held in Sedalia January 17 and 18, 1893.

The secretary, S. G. Lewis, had been unable to attend to the duties, and local arrangements were entrusted by President Erwin to a local committee, of whom G. B. Lamm was the leading spirit. A good program of music, papers and addresses was arranged and presented, and a very creditable premium list of articles, contributed mostly by Sedalia merchants, was offered for dairy products shown, and which resulted in an exhibit that would have been creditable in any dairy state in the Union. The meeting as a whole was a very successful one.

About thirty-five new and renewed memberships were secured.

The officers elected were: J. L. Erwn, president; John Patterson, vice-president; Levi Chubbuck, secretary; G. B. Lamm, treasurer.

Among the resolutions adopted at that meeting was one commending the efforts of the Hon. J. T. Moore, of the House of Representatives, to secure the enactment of a law requiring makers of oleomargarine to color the product pink; another asking the legislature to enlarge the usefulness of the State Agrtcultural College and Experiment Station, to the end that the dairy industry might be benefitted; also one complimenting the State Board of Agriculture for the interest it had taken in the development of dairying.

FOURTH ANNUAL MEETING.

The fourth annual convention was held in Carrollton, Mo., January 11 and 12, 1894.

Having now briefly recounted the formal proceedings of the association, as appears from the records, let us retrace our steps and gather up some practical facts pertaining to its work.

As stated at the outset, the speaker, then an official of the Board of Agriculture, took the initiative in bringing into existence the State Dairy Association, believing that this was within the letter and spirit of the law creating and governing the Board. My conception of a proper organization of the Board of Agriculture and its work is that it should be a body which should have for its work the encouragement and development of all the agricultural interests of the State, either working directly with the farmers who may be engaged in general or special farming, or, if organizations of special farmers like dairymen, swine-breeders or bee-keepers exist, to work with and through these organizations, they all recognizing the Board of Agriculture as the

general head of the agricultural interests of the State. It was with this idea in mind that in organizing the system of Farmers' Institutes held by the Board of Agriculture, that attention was paid to the various agricultural interests. During three annual series of institutes, J. L. Erwin, President of the Dairy Association, was asked to attend the meetings and lecture in the interest of dairying in Missouri.

Let me pause here long enough to pay a tribute to Mr. Erwin, who has served this Association as its President from the time of the first annual meeting until this summer, when he resigned by stating that he has given time and money for the advancement of the dairy cause, for which he has been poorly paid financially. His services have been invaluable and will be recognized in the future, when the dairy industry shall have become developed. Let the few who appreciate what he has done keep his memory green while he is yet in the flesh, that future generations of dairymen may know somewhat of their indebtedness to him.

Another speaker employed by the Board and chosen in the interest of the dairy industry was S. C. Bassett, Secretary of the Nebraska State Dairy Association.

Joseph Drury, then Secretary of the Southern Illinois Dairy Association, was engaged as lecturer one season.

J. Y. Sawyer, formerly a successful dairyman in Illinois, now engaged in the dairy supply business in Chicago, was with us two seasons, lecturing on dairying and dairy machinery. He was also during the summer of 1891 sent on a tour of inspection of the butter and cheese factories of the State, to determine, if possible, the prevailing conditions which made a success or failure of the business. His valuable report will be found in the second annual report of the association and twenty-fourth of the Board of Agriculture.

For two years past our honored acting president, Mr. John Patterson, has been called to the aid of the Board of Agriculture for this line of work, and has rendered most efficient and acceptable service in that capacity, as I am assured by the Hon. John R. Rippey, present secretary of the board.

As has been intimated, the Board of Agriculture published the proceedings of the association, the first two meetings in the annual reports of the board (once in separate pamphlet form, 1000 copies of each issue), and 3000 copies of the third meeting's proceedings in separate form.

All of this has been very helpful to the Association; in fact, it is hard to see how a state dairy association could have been maintained

but for the assistance that has been rendered by the State Board of Agriculture.

Some pertinent questions might be asked here. Why, in view of the individual effort that has been made and assistance rendered by the State Board of Agriculture, has not the dairy association flourished better, and at least gained more members? Why are there so many idle creameries in the state and so few in successful operation? and some others of this tenor.

My answers will be grouped under three heads:

1. Lack of co-operation and appreciation.
2. Lack of education.
3. Lack of legislation.

Really all of the trouble might be spoken of under the one term, lack of co-operation. I know how hard—nay, practically impossible—it is to get everybody to take an active interest in matters which vitally concern them; but let me ask this question: What would have been the result by this time if, say nine-tenths of the butter and cheese factories of this State had four years ago become members of the Association and contributed each an annual membership fee of $5.00, and one out of fifteen of the people of the State who are making a specialty of dairying had joined and added each $1.00 membership fee? Is there any doubt but that Missouri would have been recognized by this time as being one of the leading dairy states in the Union, a position which her natural advantages ought by this time to have won for her?

Such an active membership and strong organization as that would have prevented the ignominious failure of Missouri in the dairy department of the World's Fair. Let me speak of this briefly at this point, for a statement which may go on record is due. As has been stated, this Association at its first, second and third annual meetings, took action favoring the showing at the World's Fair of Missouri dairy products, to show the adaptability of the State for dairying. At the second meeting of the World's Fair Commission, Hon. J. K. Gwynn was asked to have a certain sum set aside out of the appropriation for that purpose; and again, at the third meeting, the matter was urged, but nothing was done until at the very last moment, when Mr. Gwynn informed us that he had asked for a certain amount of space in the dairy building for the Missouri dairy exhibit, and stated that the Missouri World's Fair Board would meet the cost of putting in the cases, furnish exhibitors with packages for their goods, and pay transportation and cold storage charges. As secretary of the Association, I was asked to correspond with the dairy people of the State and ascertain who would

exhibit. I did this, and got not many favorable replies, it is true, but enough so that I thought we should have quite a respectable show in quantity, and was sure it would be creditable in quality. But the Executive Commissioner did not see fit to let our dairy association manage the dairy exhibit, and my returns from parties who would have exhibited were turned over to him.

It will be remembered that the World's Fair management failed to get the dairy building ready for the first of the series of monthly exhibits, and that failure, together with a notion that Mr. Gwynn somehow got into his head that Missouri did not stand any chance in the dairy field anyway, led him to abandon entirely the dairy exhibits from this State, and I was instructed to notify the parties who had agreed to exhibit not to ship goods, and thus Missouri scored a failure in that direction, which Mr. Gwynn, in his official report published after the fair, unjustly charges to the indifference of Missouri dairymen.

In refutation of the idea that Missouri would not have been "in it" at the World's Fair, I want to refer in this connection to what was done at the St. Louis fair less than two months ago. Mr. J. K. Gwynn, who is now Secretary and General Manager of the St. Louis fair, requested that the Missouri State Dairy Association aid him in making a dairy exhibit at the fair. Arrangements were completed late in the season, after the fair catalogue had been printed. The dairy premium list was inadequate, and this had to be remoddled and added to, which was done at the cost of much time and labor by soliciting contributions from St. Louis business men. A separate building was set aside for dairy exhibits, and suitably prepared, after an almost endless amount of trouble. The revised premium list was sent out all over the country, and responded to by exhibits from Ohio, Indiana, Illinois, Iowa, Wisconsin, Colorado and Missouri. Missourians were, of course, especially urged to come to the front, and they did, taking every first premium offered for butter and third on cheese. This, in competition with butter made by winners of first premiums at the World's Fair from Illinois, and from the great dairy states of Iowa, Ohio and Indiana, is ample proof of what we have been strenuously contending, that Missouri is a good dairy State; and this ought to eliminate the factor—lack of appreciation—from the problem, how to develop the dairy industry in Missouri.

Factor No. 2—lack of education—is, we believe, being rapidly eliminated from the problem. The work that the Board of Agriculture has done in holding farmers' institutes, and in publishing and distributing dairy literature, the meetings held by the Association and the good influence of the dairy and the agricultural press, are all surely leading

the people to look with more favor on the business of dairying, and to the adoption of better dairy methods. The most that seems to be lacking in this particular is some activity at the Agricultural college and Experiment station in the direction of dairying.

The last, but by no means the least, factor in the problem is lack of legislation. The legislation required should be both positive and negative. There should be, first, an item of not less than $2000 for two years included in the appropriations to the Board of Agriculture, to be expended in the interest of the dairy industry. Second, a bill should be passed requiring that the Board of Curators of the State University be required to establish a dairy school in connection with the Agricultural college, not necessarily at Columbia, and making an appropriation for its establishment and maintenance. Third, some negative legislation which will prohibit makers of oleomargarine and similar products from putting them on the market under the guise of butter and cheese.

This matter will, I presume, be fully discussed before this meeting adjourns. Let us do so in the spirit of justice to all, but come to conclusions which will leave no room to doubt as to where we stand, and ready to do our part toward meeting the issue. Permit me to relate an incident or two in this connection. A short time since I went into a restaurant in Kansas City for supper. With other articles was served a pat of what my sense of taste told me was not butter. I asked the waiter if he could not bring me some butter, which he did. Friday night on my way here I went into Staley & Dunlap's restaurant for supper, and again was served with butterine. I objected to it to the waiter, and was informed by him that nothing else was used there. When I paid my bill I said to the clerk I never expected to eat there again. He was, of course, surprised, and wanted to know the trouble. I told him, and his face fell. He admitted that he had used nothing else for seven years, and did so because it was cheaper than good butter, and they could keep it easier, as they had no good place to keep butter; and he said that I was the second person only who had ever complained of the stuff.

I want to know if hotel and restaurant keepers who solicit my patronage have a right, either moral or legal, to knowingly deceive me by putting before me an article of food in the guise of another.

Less than a month ago I was on a United States Goverment quarter boat, on which were boarded a large number of employes, ranking from the engineer, who, with the rank of captain, was in charge of the works, down to common laborers. My friend, the engineer, took us through the commissary, kitchen and eating compartment. We noticed

on the round a number of tubs of oleomargarine, with the revenue stamps affixed, and inquired if Uncle Sam made his employes eat that stuff. We were informed that pure butter was provided for the officers and men above a certain rank as to pay, and all men below that ate oleo in place of butter. Did you suspect that the great United States Government made class distinction, and marked these with oleo margarine? Shame on Uncle Sam!

In a letter dated November 20, 1894, J. L. Ewin writes me: "Lunatic Asylum No. 1, at Fulton, Mo., has just contracted with Swift & Co. for 1000 pounds of oleo at 17 cents per pound, for the next six months, with which to feed the lunatics on. Think, will you, of the most unfortunate class of living creatures, whose terrible misfortune in many cases is due to ill health, being compelled to eat an unhealthful, indigestible substance, given to them for and in the guise of butter. Will the friends of the unfortunate approve of this? For humanity's sake we hope not."

One word more in this connection: There are commission merchants in St. Louis and other market centers who will not handle the oleo goods, and hotels and restaurants which will have nothing to do with them. Do dairymen look those up and patronize them? I think we ought to stand by those who stand by us.

In conclusion, let me urge that the meetings be made the beginning of a forward movement on the part of the dairy interests. The work of the past four years has been that of organization, equipment and discipline. It is now time that the Association was got into fighting trim, and assault be made on the stronghold of ignorance, unprofitable methods and fraudulent competition. Let this meeting be a council of war during which a campaign shall be adopted, and the order be, forward, march!

I may add that Mr. Chubbuck might with justice, claim considerable credit as having nursed this Association, which would hardly have attained its fifth year without his aid, given freely and without recompense.

Music and a lively talk by Mr. A. Woodhull filled in the balance of the evening. Mr. W. said he wanted Higginsville to show at least fifty of the pretty women for which they were renowned, and paid sturdy Mr. Nelson a high indirect compliment by saying that the Alma creamery butter was so nice, he was sure some pretty woman had her hand in making it. Nelson neglected his opportunity to jump up and show his pretty fist.

November 27, 9 a. m.—Mr. C. W. Murtfeldt spoke against starting creameries before the country was ready for them. You can't start a

creamery like a clothing or shoe factory; it takes time to get a herd of cows together, etc. Praised the Jerseys and believed in private dairying.

Dr. Ramsey spoke about the sudden deaths of cows after calving, and explained that it was caused by apoplexy, as the flood of blood to the fœtus does not stop suddenly. He recommended a dose of stimulant, consisting of two ounces of spirits of nitre, one ounce of ammonia and two ounces of brandy every half hour.

Mr. Murtfeldt then spoke in German, and, indeed, out of the 180 auditors, but ten or fifteen were not Germans. He said the cow must be given something in order to give anything back. To rely on cropping wheat and corn would not do; his experience told him not to have too many eggs in one basket. Butter, milk and eggs bring more cash and keep up the fertility of the soil. He thought some cows gave more cheese and others more butter. The Holsteins were better for cheese—the Jersey for butter.

Michigan salt was better than that from New York (?), but the best came from Liverpool. The cream must be aerated but not exposed to draught, as that makes it leathery. The butter must be uniform in color, and artificial color was all right, though he had never used it.

He boomed the Jersey for all he was worth; he did not want a "living hay wagon" (referring to large cows).

Milking three times a day was discussed, but Mr. M. did not explain that but few Jerseys gave milk enough to need it.

Mr. H. Toreuemke of Alma said that as Mr. M. had claimed it best to sell milk, then to make butter and then cheese, why not have twelve farmers combine and build a creamery and sell their milk, and thus save the wife labor and secure more money? Of course the farmer must learn to feed and care for his cows properly.

There was a fair tendency to discussion, but it was not encouraged, and the English session was resumed.

Mr. William Bruns of Concordia then read a paper on breeding up a dairy herd, and told how he had started as a boy with Short-horns, but got disappointed with them as milkers. He then tried Ayrshires, but found them vicious and was afraid of them. He finally was converted to Jerseys by the Babcock test, which he claimed to be to the dairymen what the scales were to the millers. In breeding we must have an eye to get the teats of proper size and shape.

In the following discussion Mr. Sheppard spoke against in-breeding, which had been recommended in an article read from Hoard's Dairyman.

Mr. Patterson acknowledged the danger, but had done it successfully with Jerseys, but not with other breeds.

A gentleman drew the line at breeding half-brother and half-sister; had done so for fifteen years.

Mr. G. B. Lamm of Sedalia, a Jersey breeder, was always afraid of in-breeding, and thought it well if Jersey breeders were to investigate if that breed was not a little inclined to deteriorate from in-breeding.

Mr. Patterson, in speaking on dairying in Missouri, again asserted that the trouble was that the farmers did not like the daily work of milking morning and evening. It is no use to blame politicians. Some years ago they blamed the railroads and other corporations for the hard times, but the fact is that we cannot compete with the Western ranches in raising steers. Land is being exhausted. He improved his land by having clover one year and plowing it under the second. He had manure enough each year for one-sixth of his farm, and used it for corn.

As to the hired men objecting to milking, he had no trouble when he did not saddle it on them as an extra chore. The men were free every other Sunday. He claimed there was plenty of work for both boys and girls, as well as for a large number of immigrants in Missouri.

It should not be our aim to make butter high-priced, but to make it so cheap that it would be eaten in every cottage as well as the rich men's houses. Then the butterine would have no chance.

Mr. Anderson, of Almira, Iowa, said that the most prosperous dairy sections in the West were those where the whole family helped in the dairy work and supported the creameries.

Mr. J. E. Nelson, butter-maker at the Alma creamery, read an interesting paper on the relation of the farmer to the creamery. A butter-maker cannot make good butter from bad milk, but may make bad butter from good milk. The milk cans are often the cause of great trouble. Once get a bad reputation for your butter and you are done for. A creamery can not run successfully unless a steady and sufficient supply of milk is provided, hence it is in the patrons' interest to increase the supply of milk.

Mr. Moorehead, of the American Transportation Co., told about Gould's creamery in Eastern Colorado, and incidentally boomed that district.

November 27, 7:30 p. m.—The evening was devoted to the denouncement of oleomargarine. D. W. Wilson gave his story of the oleo war in his usual eloquent manner, and W. N. Tivy of St. Louis jumped on the Elgin Board, claiming that it had ruined the business.

He very sensibly recommended the equalization of the prices, so that fine butter should be about 20 cents in summer and 25 cents in winter.

Mr. G. B. Lamm read his denouncement of oleo in a very pleasing manner, and with great emphasis.

The feature of the evening was a poem by Mrs. George E. Dugan, of Sedalia, and a little skirmish about women milking, in which Mrs. D. called for a vote so worded that only Mr. Lamm and the writer had the assurance to show their hands.

November 28, 9:30 a. m.—Mr. Chubbuck read a paper against oleo by J. R. Rippey, Secretary of the State Board of Agriculture, and Mr. Sawyer moved a resolution of thanks to the State Board for its official support, and a request that it be published in their report.

Mr. Tivy, who had judged the butter, together with J. M. Chamberlain, traveling for J. H. Holsten, of New York, and W. R. Goodrode, traveling for George W. Linn & Son, of Chicago, read the awards.

Prof. W. J. Quick, of Columbia, described his impressions of dairying in England and Switzerland in a very interesting paper, though I doubt there has been such a change in England since I was there in 1889, to justify the claim that hardly any butter color was used, and that the English cheese was poorer than American, and that the better class of people use American and other imported cheese in preference to home-made. He advocated coloring the butter through the cow by feeding carrots, and spoke enthusiastically enough about root crops to satisfy even friend Hyatt.

R. L. Wright of St. Joe went for the professor on the cheese question.

Prof. Quick then extended an invitation to the association to meet permanently at Columbia and to help him in getting a dairy school established.

Mr. Patterson wanted to know what benefit tax-payers had from the agricultural college anyhow, and thought new management was needed.

Prof. Quick then disclosed a most deplorable state of affairs at the college, and Mr. Chubbuck even went so far as to assert that there had been outright dishonest representations made by officers of the institution. It seems that two chairs, those of Political Economy and Pedagogy, had been ranged in under the agricultural department, and that it has virtually been made a dumping ground for students who had been unable to pass the entrance examinations to other departments. That there is need of thorough investigation was made clear, in spite of Prof. Quick's attempt to protect his superiors. The Association decided to appoint a committee to confer with the State Board of

Agriculture and the board of control as to establishing a dairy school, and securing $1000 a year to assist the Association in its work.

It was also resolved to ask the Legislature to recognize tuberculosis as an infectious disease, and that owners of condemned cattle be partially recompensed.

Dr. Turner, the State Veterinarian, regretted that he had not the power to do much good, and advocated killing all tuberculous animals, even those slightly affected. He hoped a co-operation with the State Board of Health would be effected. He spoke about the moral responsibility dairymen had when sending out dairy products from tuberculous animals, and did not seem to believe in the practicability of protection by pasteurizing or sterilizing.

Mr. Patterson was elected president by acclamation, Mr. Bruns, vice-president, and Mr. Chubbuck, secretary and treasurer.

The following resolutions were also adopted:

WHEREAS, The dairy industry of this country and the State of Missouri is the most important of agricultural interests; and

WHEREAS, It is a certain fact that throughout the state imitation compounds are extensively sold and consumed under the names of butter and cheese, thereby defrauding the great mass of consumers and endangering their health, as well as seriously crippling the honest dairy industry of the state; therefore, be it

Resolved, That the Missouri State Dairy Association, representing the creamery and dairy interests of the entire State, do most respectfully request and demand from the incoming legislature such legislation and provisions for its enforcement as will most effectually prevent the sale of imitation dairy products, except under their own true name and character; also be it further

Resolved, That we do respectfully recommend to our law makers the adoption of the main features of the Iowa state law regarding the adulteration of dairy products, modified to the requirements of our State; be it further

Resolved, That we indorse the action of the National Dairy Union, and respectfully request our members of Congress, both representatives and senators, to support and vote for the Grout and Hill bills, giving states the right to legislate regarding adulterated dairy products.

Resolved, also, That the thanks of the dairymen and agriculturists of Missouri are due to the Hon. W. H. Hatch, of this State, for his untiring efforts in behalf of the dairy and agricultural interests of this country; and we further request him to secure consideration of the Grout bill at an early date; and be it further

Resolved, That the Missouri State Dairy Association send a delegate to the annual meeting of the National Dairy Union, to be held at Washington, D. C., and that Levi Chubbuck be the delegate.

November 28, 2 p. m.—A. Woodhull declined to read his paper, owing to press of time, and L. W. Hayden, of St. Paul, Mo., then read his on "Ensilage as a Dairy Food." This was a first-class paper, and it evolved the only real live discussion during the meeting.

Mr. Sheppard told about a neighbor of his who blamed silage for causing ropy milk, and also about another case.

The writer said he had attended 100 conventions and never heard of this complaint before. Ropy milk was nearly always caused by a lack of cleanliness.

A lively discussion about the value of shredded corn-fodder seemed to develop a preference in the audience for this style of preserving corn-fodder to ensilage, several telling how an old threshing machine might be made to do the work of the expensive shredding machines. It was claimed that large piles of cut and shredded fodder could be preserved without heating too much.

Mr. Sheppard told how he cultivated his corn so as to have no weeds in August, and then sowed wheat for pasturing, and Prof. Quick then spoke about the Polish wheat (goose wheat), as being the best for pasturing.

It is a great pity that no stenographic report was made of this discussion.

Mr. D. H. Kennett, representing the C., B. & Q. in St. Louis, spoke about the milk supply in large cities. St. Louis uses daily 50,000 gallons, of which only 12,000 gallons are from the country, and of this only 2400 gallons from Missouri. The rest is city (swill) milk. Kansas City uses about 15,000 gallons, of which only 4000 gallons is from the country. He spoke in favor of a sharp milk control. I did not hear the last papers read, but, take it all in all, this was a very successful meeting, and it showed a growing interest in this all-important industry.

The scoring was as follows:

Creamery butter—Mayview, 92⅞; Corder, 88⅔; Cook & Son, 88; Alma, 88; Amity City, 87⅞; Star, St. Joseph, 87; Sweet Springs, 86¼ (gets the Russian separator watch); Helena, 85; Centralia, 83⅞; Concordia, 77⅞; Adams & Son, 83⅞.

Dairy butter—Mrs. Robins, Mayview, 94⅛; H. F. Ditmer, Concordia, 91⅞; H. C. Best, Golden City, 95⅛; John Patterson, Kirksville, 94⅞; Fred. Lepman, Corder, 93; L. W. Hayden, St. Paul, 92⅛; Mrs. Asbury, Higginsville, 88; P. E. Ayers, Higginsville, 92⅞; Mrs. Masterson, St. Joseph, 84; Mrs. Eva Young, Lexington, 95⅛; Mrs. T. C. Sawyer, Lexington, 96, and E. Jennings, Higginsville, 77.

Cheese—Kidder cheese factory, 95. J. H. M.

The Relations of the Farmers to the Creamery.

By J. W. Nelson, Alma, Mo.

The relations of the farmers to the managers or proprietors of the creamery should always be of a pleasant nature personally, because pleasant personal relations enable each other to help the other financially.

The farmers and the creamery men are supposed to work together for the financial benefit of both; one is to aid the other in making a decent living and a little money for both "to lay up for a rainy day." Therefore both parties should understand the difficulties in their way, and exactly what each ought to do for the other. The farmers have their difficulties and the creamery men have theirs. If one does not act fairly or do his honest duty, both parties suffer. Each side owes something to the other.

I must say, in the start, that I think the creamery man is the most likely to do his full duty, for the reason that he sees and knows the necessity of making good products in order to make good profits on the capital and skill which he has invested in his creamery. He is compelled by self-interest to produce the very best results he can produce from every kind of material that is placed in his hands. If the creamery man does perfect work; if he uses the best machinery, the best methods, the best salt and butter color, the utmost cleanliness to produce the best butter, he can only produce poor butter if the farmers and patrons have sold him poor milk from which to make it.

The most skillful jeweler cannot make a diamond from a brick-bat; nor can the wisest teacher make a genius out of a natural-born fool.

On the other hand, if the creamery has the very best milk or cream, and the creamery man is ignorant or careless, he cannot produce a good quality or a paying quantity of butter or cheese.

Taking it for granted that the creamery is well equipped for work and conducted by men of intelligence, skill, experience and honesty—and they usually are—the first duty that the farmer patron owes to the creamery man is to furnish him with good milk or cream. In order to do this he must have good healthy cows. The cows should be well fed with the food best adapted to milk production; and second, the cows should be well protected from the extreme heat and cold. No cow, scrub or thoroughbred, will produce milk of the best quality or

the largest quantity if she shivers amidst stormy blasts, in the open air, or pants in the rays of the blazing sun.

Third—No farmer can take pure, well-flavored milk, which will produce first-class butter, to the creamery, if he allows his cows to drink water thick with rottenness and foul with stench. He cannot expect the creamery to produce prime butter or cheese if he dumps milk into the milk vat which has come from the udders of cows affected with lumpy jaw, or fever or cake, or from cows too soon after calving. Five gallons of milk from such cows, tainted by foul water, by noxious weeds, by the poisons of disease, will spoil the flavor of fifty gallons of pure milk, and the flavor and keeping quality of butter or cheese made from it.

And what is the result to the farmer and the creamery man? The grade and reputation of the butter is lowered; the spirits and the efforts of the creamery man are lowered, and soon he will begin to lower the price paid for the milk brought to him by his patrons. He positively *knows*, in most cases, that the fault lies in the milk, and both he and the farmers suffer in consequence in pocket as the outcome.

"Put not new wine into old bottles," says the Bible. Put not fresh milk into foul cans, I say. A new source of danger to milk has been recently discovered. Milk cans in transportation are often battered and wrinkled. From these spots the tin is worn off and the iron sheet exposed to the action of the milk. Iron in sufficient quantity enters the milk so as to give a bitter or most unpleasant taste to the butter. Put milk only into clean, unrusted cans.

If the farmer mixes skimmed milk or old milk with fresh milk, or waters his milk, or puts some substance in to give it color or weight—no matter whether he sells by the Babcock test, by the gallon or by the 100 pounds—he is lessening the power of the creamery to make good products, and the reputation of the creamery in the markets is lowered and the profits of all concerned are decreased.

If, on the other hand, rich, pure milk and cream are furnished the creamery, in nine cases out of ten it makes good products, and the creamery man, seeing that he is aided and benefited by the wide-awake farmers, is ready to advance the price of milk and keep it steady.

"Give a dog a bad name and then kill him." Let a creamery once get a bad name in the market, and the market soon kills it, and in killing it also kills the goose which lays the golden egg for the farm milk producer. The farmer who does not furnish good milk is driving a few nails into his own financial coffin.

In cases where milk is paid for by the test of butter-fat, Mr. A., who sells two and a half per cent milk, should no more expect to get

the same price for it that Mr. B. does, who produces four and a half per cent milk, than he should expect to get a $5 pair of trousers for $2. Another point: Suppose a patron of the creamery keeps five cows, which "eat their heads off" and still give only a small quantity and a poor quality of milk. He does not make much profit off selling his milk to the creamery, withdraws his patronage, and, by example, may influence some of his neighbors, who are making a living profit, to do likewise or grow lukewarm. Now, the creamery man has invested his skill, experience and capital in the midst of the farmers, first, to make an honest living for himself and family. But in doing this he is establishing a new industry, which gives a new outlet and market for a valuable farm product, which has been heretofore worth but a trifle; he is giving the farmer a new and steady cash revenue.

If the farmers do not all try to produce and sell their milk to the creamery in sufficient quantities, and at a price which will enable the latter to make a living profit, the creamery fails or "pulls up stakes." The careless, unprogressive farmers injure the whole community, cut down the revenue of their more enterprising neighbors, and root out an enterprise that might have grown and produced great results, to the benefit of all.

A creamery cannot go on without a sufficient and steady supply of new raw material, and the farmer can make but little out of his milk unless he does have a creamery within reach. This is a self-evident fact in regard to the relation of the farmer to the creamery. Since the creamery man has invested his capital, and other farmers are investing their capital in better cows, should not the other man, with the five poor cows, make some effort to help himself, his neighbors and the creamery by investing capital or effort in getting cows that would give him a decent profit?

It is of vital importance that every state, county or district should, in the first place, build up a reputation for its dairy products in the home and outside markets first, and then maintain it. The creamery man cannot always do this by his own efforts; he must have the co-operation of his patrons, the farmers. What would become of the world-wide reputation of the Elgin and New York butter districts, or of the Canadian and Danish and Swedish butter and cheese districts, and the prices and profits of their products, without the hearty and intelligent aid of the farm milk producers? They would be destroyed in a few years, in spite of all the improved machinery, scientific methods, skill and experience of the creamery men. The lack of co-operation between the cheese factories and the farmers of the United States has already robbed the dairy interests of the United

States of millions of dollars annually and given it to Canada. United we stand, divided we fail and fall. I cannot, within the scope of a short address, give all the points in regard to the relations of the farmers to the creamery; but I have pointed out thus far some of those which daily actual experience as a creamery man in a farming district finds of the most importance.

The creamery managers make arrangements every week to handle so much material within a given time. Now, suppose one farmer, or half a dozen, vary in the amount of milk they bring, or are late in its delivery for several hours, or neglect to come for one or two days each week. All the plans of the creamery are thrown out of kilter, and the best and largest results cannot be produced. The farmer owes it to the creamery to be as prompt and regular in his delivery of material as circumstances will permit.

The farmer should also make arrangements so that he may take back home the same day or trip the skimmings that he receives. Otherwise they sour and lose much of their feeding value.

You often see a good team drawing a heavy load. One of the animals in it is wide-awake, willing, full of spirit, always trying "to get there," through thick and thin. The other, though equally as strong and able, equally as important in drawing the load, is lazy, slow, lacks vim and willingness and quickness, and is ever ready to give up when passing through a rough piece of road. When you get to an extra "tight place" the willing horse will pull with might and main, until he exhausts his breath and strength; while the other one creeps along, don't keep up his side of the load, and the result is you are "stalled." That is a practical illustration of the relations of the farmers to the creameries. I do not pretend to say, you must remember, that it is always the farmer that represents the slow horse and the creamery man the swift one.

It is certain, however, that the creamery man, as a rule, pushed on by his desire to lessen his labors, increase his profits, and finally establish his business, is constantly studying improvements in the creamery business; trying experiments; adopting new methods which prove good; watching the difficulties that his farm patrons have to deal with; and trying to remove the obstacles in their way, in order that his own way may be made smoother. While the creamery man is climbing to a higher place himself, he is also striving to "pull up" with him his patrons and co-laborers. Should not the farmers, then, listen to his advice; weigh his suggestions on improvements, try them, and if found good, put them into practice; and thus by aiding the creamery man, help themselves also?

A new condition has developed in the West in farming, which will enable the wheat-raisers and milk-producers and the creameries to try a new experiment, in which one should help the other for mutual benefit. Wheat is not, at its present price, a paying crop to sell; but experiments in feeding it to stock, which have been made all over the country, have shown that by this method a farmer can get a price for it that pays well for its cultivation. There are few better milk-producing foods than wheat fed in some form to milch cows. Now, if the creamery man is to test its values, in producing a fine quality of dairy products; if he wishes to show the farmers that they can make more out of their wheat by turning it into milk and cream for the creamery, he must have the co-operation of his patrons. They must all pull together. The farmer who feeds wheat to his cows should keep an account of the quantity and the form of wheat he feeds, and of the increase or decrease in the quantity or quality of milk he gets from the cows so fed; their conditions of health and weight, and the cost of wheat as a food compared with the price he gets for his milk or cream.

The creamery man will note the effect on the flavor of butter or cheese, the quality of butter made from the cream of milk from wheat-fed cows, its keeping qualities, the churnability of the cream, and all other points that come under his notice. He can keep the farm patrons informed as to the results of his observations, and by this interchange of actual experiences both will be benefited. In all the relations of farmers and creameries both should remember that they are working for the same end: that is to build up an industry, by mutual and harmonious effort, that will make the lives of both more easy and prosperous.

Argument

In behalf of the Dairy Industry, and against the fraudulent competition of imitation goods.

To the members of the General Assembly of Missouri:

As a dairy state, Missouri should rank at the very head. She possesses a combination of advantages of soil, climate, water, geographical location, and other natural facilities for dairying, to a degree not found in any other state in the Union.

A proper development of the State's resources in this direction would add millions to the taxable wealth of the State, yield a living to a vast army of people, and greatly increase the supply of the most healthful, nutritious and cheapest class of food known to man.

Dairying as a distinct industry is one which contributes as much of real benefit to a community as any that can be named. It is a business in which the individual, independent farmer can engage, or a number can join in a co-operative enterprise.

The poor man with but few acres, the renter and the widow with a family of small children to support, can with one or more cows make advantageous disposition on the farm of the ordinary crops of the small farm or garden patch, receiving in return from the cows a perfect food for the family, and from the surplus, produce food articles of commercial value. Thus, while it is a business in which capital can be invested on a comparatively large scale, using costly machinery and employing highly skilled labor and great executive ability, it can also be, and to a very great extent is, one of small individual investment, but aggregating an enormous sum And, differing from almost any other line of labor, the small dairy man or woman can, with intelligence and inexpensive, rude appliances, produce an article which will equal in quality that produced from herds of 100 or more cows, or in co-operative creameries.

The business is essentially one for the masses, in that it can be engaged in on very limited capital, gives employment, either in the field or garden, in producing food for the cow, or in barn or dairy-house, in milking and working up the product, for all members of the family old enough to work at anything, and for every day in the year. The products when sold yield an income which, though it may be small, is constant. The effect of the business on the farm is that of constant improvement of the quality of the soil.

Dairying is a business which conduces to reducing the size of farms, thus adding to the population which may be supported in the country, improving the schools, churches and social advantages, all of which has a direct beneficial influence upon the people and business of the towns. Withal, it is an industry, the products of which are human food of the most nutritious and healthful character.

This important industry is being destroyed, and those engaged in and dependent on it are being driven to other means of support, and the people are being deprived of a source of food supply—by whom, how, and for what purpose? A few men—hardly more than can be counted on one's fingers—having grown rich in the meat-packing business by methods not always above suspicion, with a greed for more that is insatiable, conceived the idea of converting a portion of the offal from the packing business into a product which, with the aid of the chemist, would so nearly resemble butter as to deceive the eye, and even the taste, of the consumer. This they have done, and hun-

dreds of tons of oleomargarine are put on the markets, and for the most part consumed by an unsuspecting public. Using, as they do, in large part, offal and waste, not to say diseased animal bodies, the manufacturers are able to make the compound and sell to retailers at from four to eight cents a pound, and still make immense profits, while the retailers, selling at prices but little below, and often higher than that asked for genuine butter of a good quality, are also enabled to make large profits; all of which, both those of the retailer and manufacturer, are paid by consumers who, in large proportion, think when they eat the article they are eating butter. Shall this fraud on the public, unfair competition with an industry in which so much of the people's money is invested, and on which so many are dependent for a living, be permitted to continue unnoticed for the benefit of a few individuals, who are already enormously rich, and the dealers who act as the tools of the manufacturer in disposing of the goods?

Respectfully,

JOHN PATTERSON,

President Missouri State Dairy Association.

LEVI CHUBBUCK, Secretary.

WHY OLEOMARGARINE SHOULD NOT IMITATE THE COLOR OF BUTTER.

It consists of cotton-seed oil, raw lard or neutral, a little beef oil, or others of like nature (the above undergo chemical treatment that preserves or embalms them, seriously affecting their digestibility), stearine, rennet, glue, gelatine or other emulsient to form the mixture, and churned, with salt and color that give the taste and appearance of butter.

Milk being the natural and requisite support of animal as well as human life, the butter contained in it is the chief factor which affords the most immediate and easiest appropriated nourishment of all foods. To the healthy, the sick or feeble, old or young alike—even the infant, when its mother's milk often fails to nourish, butter will do so at once. How is it with oleomargarine? Quite the reverse, no one of its component parts being so adapted; while, united, they are still worse, owing to their chemical treatment, requisite to subdue all smells and preserve or give the keeping properties—"embalm it." Cotton-seed oil, for instance, one of its largest factors, is objectionable even in its natural raw state.

Neutral or raw lard oil comes next (one table-spoonful of which will upset a strong stomach). Admitting it to be produced from regularly slaughtered and healthy hogs (which it seldom is), being absolutely raw and pressed out at a little over blood heat, which

cannot destroy any living germ or disease, as the high temperature used in rendering lard will, such heat makes lard safe and more digestible, but would granulate the oil, thereby rendering it useless for making oleomargarine. Of beef oil there is a small proportion used; neither is it or any of the sweet oils used so objectionable, more than that the former is liable to chill in the stomach after cold drinks.

Stearine, used most in summer to give the mixture consistency, is decidedly objectionable and hurtful to the system—more so than is the glue, gelatine, rennet, etc.; salt and color, being least harm, yet hide most defects. The most disgusting part comes in the beginning—handling, heating and pressing the oil out of the carcass, offal, trimming, etc., that may be ever so badly tainted, or even when the material is from a regular slaughter-house it is unpleasant up to being deodorized with chemicals, which not only subdues all smell or taste, but preserves or embalms it, so that it will keep almost anywhere a long time, even in the stomach, digestion has a hard fight to get away with it.

FRAUDULENT BUTTER.

(Extract from a paper read by G. B. Lamm, Sedalia, Mo.)

The profits of this vast enterprise are being readily absorbed by the sale of an article known in the trade as oleo and butterine. Oleo is not butter. It is so colored and manufactured and dished out as to look like butter, but the consumer is deceived when he eats it for butter. The restaurant, hotel or boarding-house proprietor deceives his patrons when he sets it before them as butter. It is not on the bill of fare.

You pay your money, but you have no choice, as you do between salads, and meats, and vegetables.

Who ever saw on a bill of fare, "dairy, creamery and oleo," from which to take your choice? How many do you think would choose oleo instead of dairy or creamery butter? Now there is the rub.

Let us demand that oleo be colored other than butter or not at all, and then the consumer has a chance to take his choice by sight and pay for what he chooses.

This does not depreciate the virtues of the manufactured butter, nor is it injustice to the consumer nor to the dairyman. We have no right to restrict men from eating oleo if they so desire. Few know its barrenness of nutrition. But all men have a right to know what they eat and of what it is made.

Alas for a people when the deserving and innocent cannot be protected! Alas for a people when demagogues and professional

politicians make the laws so as to favor the few at the disadvantage and deception of the many.

And this is what is done when we allow oleo to be colored as butter and palmed off as such upon an unprotected public. Its true character is unknown to the many who buy it and the many who eat it, and this fact thwarts justice among the consumers and destroys a legitimate trade which would insure prosperity to the producers of dairy products. * * * * * * *

IMITATION DAIRY COMPOUND.

The following paper by J. R. Rippey, Secretary of the Missouri State Board of Agriculture, was read before the meeting:

With a climate unsurpassed by that of any state in the Mississippi valley, with unrivaled fields of rich, nutritious blue-grass, with clover and timothy growing in abundance and luxuriant as a tropical forest, with a soil susceptible of the highest cultivation and capable of growing more varieties of cereals and grasses than can be produced elsewhere, with all conditions equal to that of any other locality, may not Missouri occupy at least a prominent position among the dairy states of the Union?

That pure butter and cheese may be produced at a profit, it will be necessary to enact such laws as will force the retail as well as the wholesale dealers in imitation compounds to sell their stuff on its merits. So long as skimmed milk and filled cheese may be branded and sold as "full-milk cheese;" so long as oleomargarine, butterine and other fradulent imitations may be sold as the best "creamery butter;" so long as the dishonest manufacturer is permitted to make and color his nauseous compound in imitation of a genuine, gilt-edged article, and the unscrupulous dealer defraud his unsuspecting patrons, that long will the dairy interest languish and the products of our pastures and fields be manufactured into dairy products with little prospects of profit and often at an actual loss. If the manufactured imitation of butter is as pure, as clean, as wholesome, as genuine creamery product; if there are those who prefer it, believe it a typical food, containing all the elements necessary to sustain life and maintain a vigorous growth of the human body; if it is a nerve and muscle-building and health-restoring food, then in the name of reason and justice, should it not be so branded and colored that they may know when they are getting it, that they may not be deceived and thereby forced to use the natural product of the cow against their wish and will?

If, upon the other hand, the manufactured imitation is a fraud, a nauseous compound, possibly manufactured in some instances from the fat of diseased animals, possibly containing the germs of disease, and

chemicals injurious to the human stomach, then as a sanitary measure, and in the interest of an industry so immense, so honorable and so valuable to the community where conducted, that is being sapped of its vitality and robbed of its legitimate profits, and in justice to the people who abhor and detest it, who value it only as they would axle-grease or machine oil, I ask why it should not be so branded or colored that they may detect or avoid it?

The dairyman has nothing to fear from the manufacture or sale of any article intended to take the place of genuine butter, if that article is sold on its merits; if the formula of its composition is given with it; if its manufacture or sale is so regulated that the consumer knows what he is eating; in short, if all elements of fraud and deception are eliminated, it will then very readily be regarded as only a grease, to be used when nothing else can be procured, and by those stomachs that have been educated to the consumption of indigestible, nauseating compounds.

Again, these compounds are manufactured and sold at a profit of from 100 to 400 per cent; and if some unscrupulous brute, without love of fellow-men or fear of God in his heart, and in violation of law, should buy for a nominal sum the dead and diseased animals that reach the great markets, render and manufacture the products into oleomargarine, these profits may be increased almost without limit.

But if this revolting feature be eliminated by carefully framed and rigidly executed sanitary laws; and if it is offered for sale only by and under the brand of the most reputable manufacturer; if it possesses all the good, wholesome and nutritious qualities claimed for it; the fact still remains that those who want it and use it are paying largely in excess of what would be a profitable and remunerative price, simply because it is sold to and consumed by untold numbers as dairy butter and at dairy prices.

If these compounds had been presented to the public in their true dress, had their composition been boldly asserted, the product now, if manufactured at all, would be counted in pounds, instead of car lots, and the business confined to 8 by 10 lots on back alleys instead of immense structures in commercial centers.

This deplorable business has been permitted to stalk through this broad land of ours, bearing the mark and clothed in the royal dress of "gilt-edged butter," for years. The nostrils of our people have been held and the sugar-coated, nauseating compound forced down them. For years they have been compelled, in the butter line, to regard as gold "all that glittered;" until this stuff has gained a prominence and a commercial standing otherwise impossible. We might ask now, when

the dairy interest of this country is tottering, is on the verge of ruin, when disaster seems to stare us in the face, that all imitations be compelled to lay aside the golden robes given by nature to pure butter, and stand upon their own merits. The consumer may then decide which he prefers, may pay his money and take his choice, and feast upon what his fancy directs and his purse commands.

It has been urged that the unrestricted sale of oleomargarine and butterine was in the interest of the laborer and poor man; that with them a cheap and wholesome substitute for butter was a necessity, and without it their tables would not be supplied; that they were demanding it and their families needed it. For sake of argument grant this to be true. Then it should be supplied to them at the cheapest possible price, and there is no necessity of fraudulently imitating butter. The cost of manufacture of oleomargarine and butterine is said to be from five to seven cents per pound, and it is claimed, and so far as I know is undisputed, that either article can be retailed at ten cents per pound with a good profit. If this be true, why should not the laborer have it at ten cents per pound? Why color and feed it to him as butter and charge him 18 or 20 cents per pound; why permit the manufacturer or retail dealer to imitate and then sell at a price just below the cost of a genuine article of dairy butter, to the detriment of the dairyman, the destruction of his industry, and at the same time extort from the laborer 8 or 10 cents on each pound? Why permit the manufacturer to claim this enormous profit from the poor man, and at the same time defraud an honorable and extensive industry of legitimate remuneration and profits?

If these compounds are meritorious, are cheap and nutritious, and in demand by any class of consumers, let us encourage the industry by giving its own color, selling under its true name, and at a price that may be fixed and can be sustained by these articles when sold and consumed as such.

But it is not true that the poor man or the laborer or their families are demanding imitation butter. The principal demand is from boarding houses and cheap hotels, where it is placed on the table, and, like a sugar-coated pill, is forced down the consumer as gilt-edged dairy butter, and without his knowledge or consent.

In most instances, it is probable that the purchaser is informed as to the character of his purchase, but, while it is colored like butter, put up in packages like butter, stamped like butter, looks like butter, and has enough butter or cream in its composition to give it the odor of butter, he simply gives it to his customers as butter, thereby be-

coming a party to the deception and fraud that is making the cow unprofitable and bankrupting the dairy interests of this country.

The laborer, on the other hand, who provides for his family only, purchases his little package of butter, the product of your cow, carries it to the good house-wife, who places it upon the table with economy, they preferring it, even though thinly spread upon the biscuit, to a loaf floated in oleo oil or tallow, or soaked in a compound of whose manufacture they know nothing, and have no guarantee as to cleanliness, healthfulness or digestibility.

Nor do we agree with the assertion that it is digestible, a nerve and muscle-building and health-restoring food, valuable for the child, the invalid, or the laborer. Investigations made upon the suggestions of the New York State Dairy Association furnish conclusive proof to the contrary. Tests made by experts with the digestive principle of pepsin substantiated the fact that it was not typical food, and that oleo oil could not be readily digested by the human system; that its use was not beneficial to the people of the State, even if they preferred to buy it.

Scientists who have followed the subject to a final conclusion are agreed that butter-fats, having been strained through the mammary glands, where they have been rectified, as it were, are better prepared for human food, and are more readily assimilated, more easily digested, than those that enter into the composition of oleomargarine and have not been so treated.

These indisputable scientific facts cannot be safely ignored. Some one has said, "Tell me what kind of food a nation eats, and I will tell you what that nation is doing." This is as applicable to the United States as elsewhere, and applies with as much force to butter and imitation compounds as to any other article of food. No nation fed upon indigestible, unhealthy food will develop into vigorous, active or intelligent manhood. To enact such laws as will protect our people, the laborer as well as the capitalist, the mechanic as well as the professional man, from deception and fraud, from the greed and avarice of unscrupulous manufacturers, and compel the branding of every article with its true name and its composition, is not only the work, but the imperative duty of our law-makers.

The question of regulating the sale of imitation butter compounds confronts the farmers and dairymen of this State as it does that of any other locality. Consult your legislator as to the best means of eliminating every element of fraud and deceit in the sale of these mixtures. You need have no fears of any open field and fair competition. Any law that will enable the consumer to tell what he is eating will answer

your purpose. A contest between oleo, as such, and pure butter will be short and decisive, and result in a "walk-over" for pure butter.

With laws that will effectually protect you from fradulent imitations, such an application to your calling as will enable you to master its details, and the blessings with which nature has so abundantly surrounded you, the future of the dairy interest in Missouri is full of promise, and will certainly prove remunerative and profitable.

DAIRY FARMING IN MISSOURI.

Missouri has 43,000,000 acres of land. One-tenth of this area, or 4,000,000 acres, could be devoted to dairy farming, and not decrease the present production in other lines of farming.

Four-million acres would make 100,000 40-acre farms, each of which would keep 10 cows, making 1,000,000 cows. These 100,000 farms, with cows, teams, tools and buildings, would be worth each $2000, or a total of $200,000,000.

A forty-acre farm will support a family of five persons, making a total of 500,000 persons who would be employed and supported on these farms.

Many herds of cows yield an average of 300 lbs. of butter a year. At 200 lbs. each a year, 1,000,000 cows would yield 200,000,000 lbs. of butter a year, which, at 20c. a lb., would be worth $40,000,000. The skim milk would be worth as human food, or to feed to pigs and poultry, $10,000,000 more, making a total annual direct income to the people of the State of $50,000,000, or an average of $500 a year to each of the 100,000 dairy farms and families.

W. O. Atwater says a pound of butter contains of elements convertible into human energy as much as do nearly five pounds of lean beef. That being the case, butter at 20c. a pound is as cheap food as lean beef at 4c. a pound, and requires no cooking.

Whole milk at $1.00 per 100 lbs., which is about the same as 20c a pound for butter, is one of the cheapest and most healthful forms of human food.

One-million cows would produce in one year human food in this cheap and healthful form equal in amount to the beef that would be made if the entire number of neat cattle existing in the State to day were to be slaughtered.

Beef cattle require a larger area of land per head than do dairy cattle, are fed principally on grain, and in such a way that the manure is largely lost, thus causing a depletion of the soil fertility. Missouri has reached the limit of profitable expansion in beef-raising.

Dairy farming means smaller and better farms, and more of them, more and better farm buildings, nearer neighbors in the country, more and better schools, better churches, better roads, and a greatly increased supply of cheap and healthful human food.

Can the State afford to permit this industry as it now exists, and with its future possibilities, to be dwarfed and in time utterly destroyed by less than a dozen wealthy monopolists—not by fair competition, but by fraud, deceit and counterfeiting?

ANNUAL MEETING

OF THE

MISSOURI

SWINE BREEDERS' ASSOCIATION,

CO-OPERATING WITH STATE BOARD OF AGRICULTURE,

AT

CHILLICOTHE, MO., JANUARY 8, 9 AND 10.

OFFICERS.

PRESIDENT—J. N. VIVION.....Callaway county

VICE-PRESIDENTS.

N. H. GENTRY..... For the Berkshires
E. W. McELHANEY .....For the Chester Whites
G. W. FALK.....For the Poland-China
COL. M. B. W. HARMON .....For the Duroc Jerseys
A. G. McCLELLAND. .....For the Victorias
J. E. DODSON.....For the Yorkshires

SECRETARY—A. J. BLAKE... ..... St. Louis

TREASURER—H. C. SYDNOR..... .....Lafayette county

EXECUTIVE COMMITTEE.

LEVI CHUBBUCK. ....Caldwell county
J. A. AYERS ....Macon county
T. A. HARRIS .....Cooper county; and the President and Secretary

The meeting was held at the request and under the auspices of the Chillicothe Commercial Club.

The opening session of the second annual meeting of the association was held in the City hall, Chillicothe, Mo. January 8th, at 7.30 p. m.

There was quite a large audience present, including probably sixty members of the association, when, after the invocation by Elder A. W. Davis, Vice-President Allen Moore of the Commercial club arose to deliver the address of welcome. He spoke earnestly, heartily and enthusiastically of Chillicothe, the character of its business men, the magnitude of the business done, the rich farming country surrounding and supporting the city, and the admirable condition of the farmers, notwithstanding the low prices of their products; then with immeasurable heartiness he welcomed the members of the State Swine Breeders' Association to the city, and expressed the hope that they would enjoy a profitable and pleasant time; and return again at the earliest opportunity. Mr. Waters responded on behalf of the State Board of Agriculture, who gave the Association their most hearty co-operation; and the order of business was called.

Boom Prices and Their Effects.

By W. A. Hill, Belton, Mo.

Mr. Chairman, Fellow Swine-Breeders, and Ladies and Gentlemen:

It affords me much pleasure to appear before you in this association meeting of representative farmers and swine-breeders of the grand old State of Missouri, held under the auspices of the Commercial Club of the beautiful city of Chillicothe. And permit me to say, Mr. President, that as I passed through the adjoining county of Caldwell, the county in which my boyhood days were passed, thoughts of by-gone days came crowding to my mind. I thought of the scenes and pleasant associations of childhood; I thought of the time when the magnificent resources of North Missouri were undeveloped, when her beautiful prairies had not responded to the touch of the husbandman; I thought of the time when the Hannibal & St. Joe railroad, that runs through your city, was being built, laying the first iron bands that connected in commercial union the Mississippi river on the east and the Missouri river on the west; I thought of the dark days of '61–5, when the soil of Missouri was enriched by the blood of her bravest and noblest sons; and today, as I viewed the magnificent country lying west of this place, the splendid farms and the beautiful farm-houses, and the wonderful transformation that has taken place in the last thirty or thirty-five years, I thought that there had been compressed into those years more material progress and development than had taken place in centuries of any other portion of the world's history.

But if you will pardon me, Mr. President, for this digression, I will now proceed to the discussion of the subject assigned to me, "Boom Prices and Their Effect." Permit me, Mr. President, to say that if it were not for the fact that this meeting was strictly a Missouri organization, this subject could have been more ably handled had it been given to Miller, of South Dakota, Lambing, of Iowa, or Pantrill and Garrett, of Illinois—men who have been strictly in the boom, if not the originators of it. And as I have not reaped any great benefit from the boom which manifested itself in reported sales of Poland-China hogs, it would naturally be supposed that I would be found on the bear side of this question. Now, we will not enter into a discussion of the genuineness of the sales reported to have been made at fabulous prices, neither will we discuss the subject of rebates

connected therewith, but we will confine our remarks to the effect that must inevitably be produced, and which will certainly follow any abnormal condition that influences prices of thorough-bred hogs or any other species of property.

While all booms are more or less beneficial to a few, the great majority are injuriously affected by them. This fact has been abundantly demonstrated, not only in live-stock of every variety, but in real estate also. The result of all booms is financial wrecks and disasters, the natural consequence of inflated values.

You are all familiar with the fancy prices that were paid a few years ago for breeding cattle—how that men crazed with excitement paid fabulous prices for cattle for this purpose; how animals of no individual merit that should have been sent to the butcher's block were used as breeders; and I believe that all close observers will bear me out in the statement, when I say that the quality of breeding cattle greatly deteriorated during this period of inflated prices, and that the business was left in an utterly prostrated condition when the boom burst, from which it has not yet recovered.

What is true in regard to cattle will apply with equal force to the horse industry. Only a few years ago a boom struck this class of stock and stimulated the breeding of the same until the supply far exceeded the demand. Common plug horses that readily sold for $75 or $80 each are now worth only about that much per dozen, and today on almost every farm in Missouri are to be found a surplus of horse-flesh, for which there is no market whatever. This condition also was brought about by boom or unnatural prices.

The same also, though in a modified form, may be said of the sheep industry, and the abnormal prices that were paid for breeding-sheep a few years ago has given place to the prices that will hardly cover the cost of production, though other causes may have operated to bring about this result. And so unremunerative are the present prices of sheep, that flock-masters are almost running over each other in order to market their flocks, and are about of the same opinion as John Randolph, of Virginia, who once said that he would go a mile out of his way at any time in order to get an opportunity to kick a sheep.

Down in my county of Jackson we have a little town known as Kansas City which we are very proud of, and a few years ago the real estate men of that town got together and came to the conclusion that it was not growing fast enough, that the ordinary course of development was too slow, that the town could not afford to wait to reach her majority by the ordinary process of development and healthful growth. And their fertile brains conceived the idea that by one tremendous

bound it should accomplish in a few brief years that which it would take years of natural growth to accomplish. And this boom that those real estate men started became contagious, and swept on with such powerful force that the whole population was carried in it.

Men would go to bed at night comparatively poor and wake up the next morning and find they were rich, so great and rapid was the rise in values. The country, for miles around, was platted and laid out in additions, blocks and town lots. Magnificent farms, whose normal values were about $50 per acre, suddenly jumped to about that much per front foot after being divided into lots. Men bought and sold with a recklessness never before known — acted as though Kansas City was destined in the near future to become the metropolis of the world.

But the inevitable reaction set in. The pendulum begun to swing in the opposite direction. There was a pause in the hurried turmoil. Men commenced taking their bearings, and they discovered that there were breakers just ahead, and they were siezed with a sudden desire to unload. A veritable panic set in, and it also became contagious. Property depreciated in value as rapidly as it had appreciated, and the result of this greatest of all booms was utter paralysis in the real estate business, from which the city is still suffering. A few men made money in the operation, but the great majority were injuriously affected by it.

Now, Mr. President, as a breeder of thorough-bred Poland-China hogs, and being deeply interested in everything that pertains to the welfare and prosperity connected with this business, you will pardon me for sounding a note of warning to my fellow-breeders, to steer clear of the shoals on which have been wrecked the industries referred to.

That there is an incipient boom being started in the prices of Poland Chinas—to prove which it is only necessary to refer you to the prices which have been reported as given for individual animals of this breed during the last year or two. It has become a very common occurrence for $500 or $1000 to be paid, or reported to have been paid for single individuals, and the breeder that cannot trace the lineage of his herd to these high-priced animals, is regarded, to use a slang phrase, as not being strictly in it. We must lose sight of the fact, Mr. President, that Poland China breeders contain in their ranks men who are as capable of formulating a boom and carrying it to as successful a completion as breeders of other kinds of stock.

When a breeder reports that he has paid $500 or $1000 for a sire, he is instantly flooded with orders for pigs from parties generally having more money than brains; and so anxious is he to fill all orders, and so unselfish is he, that he does not want to keep all the good

things himself, that he will often ship a pig to the party buying that will not compare favorably with the worst specimens the purchaser has in his herd. But, having paid a long price for the pig, he reasons on this line, that, being the offspring of a $1000 hog, he will not breed after himself, but after his illustrious sire; so he mates him with his best sows and anxiously awaits results, and when these results come around they are infinitely disappointing, and he wonders why it is that he has made no improvement in his herd. He loses sight of the fact that he has bought about four-fifths reputation and one-fifth pig. While the $1000 man may have reaped a rich harvest from his investment, his victims, who can be counted by the score, are left to ponder over the uncertainties of all earthly hopes.

Now, we would not have you infer from our line of reasoning that we are averse to paying a price commensurate with the breeding and individual excellence of the animal. Neither would we create the impression that it is unnecessary to pay due regard to certain blood lines that have proven so prepotent in placing this breed in the position it occupies today. But we would discourage every effort to place a fictitious value on or boom the prices of Poland-Chinas, believing the effect will ultimately prostrate and place this business on an unremunerative basis.

Thanking you for your patient hearing, and hoping I have let fall a few thoughts that may prove beneficial to the swine-breeders of Missouri, I submit this subject for your consideration.

DISCUSSION.

This was participated in by H. C. Sydnor and others. Out of this discussion one gleaned this leading thought: Legitimate business only brought permanent success; boom prices gave temporary success. As much above the true lead as the boom goes, just so far below will it eventually go before permanency is secured. The slower growths are the lasting growths.

The Hog's Foot.

By Capt. D. Gillson, Appleton City.

I regret my inability to be with you in annual meeting, and being in consequence deprived of the privilege of making the acquaintance of my fellow-breeders of the State, to all of whom I send greetings. The subject assigned me, "The Hog's Foot," reminds us of the admonition of the parable in which we are told of one who built his house on a sandy foundation, and of another who selected firmer ground.

In breeding swine, as in building a house, it is possible to lose sight of vital points in our efforts to produce attractive ones—to catch the eye of the purchaser and get from him a price that the future hardly warrants. A loss of time and labor are poor rewards for what little beauty in form he was captivated with. I regard the foot as one of the most important points in a hog, and one that is often neglected. To me the foot is a forecast of much else in the make-up of a profitable animal. The hog is a machine employed by the farmer to convert farm products into money, and when he loses his power of locomotion his profits and admiration both vanish. Exercise is conducive to health and growth, as well as to a strong and vigorous constitution, and without it an animal soon becomes a mass of deformity, and makes an unprofitable storehouse for the products of the farm.

From the standpoint of profit thus viewed, we may build the animal structure in keeping with our ideas of form and beauty, and keep pace with the progress of recent years, which calls for great weight at an early age, with the ability to carry still more at a greater age, should circumstances make it necessary to continue feeding. To maintain these qualities we must ever keep an eye on the foundation.

To describe or convey an accurate idea of what I regard a good foot would be hard to do, and if I should attempt to mould one out of the finest material I would spoil it before half completed; but my observation is that a short, broad foot, covered with a thick, heavy horn, standing erect, short between the hoof and first joint, are the most capable of carrying heavy weights, and they seldom get too large if well formed.

We are all trying to produce that which will prove the greatest source of profit, as well as having a partiality for that which is a thing of beauty, and said to be a joy forever.

This is surely not always the case in swine-breeding, for we rarely see a profitable animal unless it has the best of feet; and those that do not are fit only for the butcher, to whom they should all be sent, regardless of form otherwise, or fancy pedigree, the cost of sire or dam, or the character of the strain of blood. Recognizing that like begets like, and that we have defects enough, even though we breed from and to the best and most perfect, can we afford to propagate from a poor, weak and ill-formed foundation? Degeneration is one of the laws of nature, and eternal vigilance only can keep pace with it or give any prospect of overcoming it. May we not, then, strive, according to the intelligence that is in us, to do the best we possibly can in laying the foundation, and then to build thereupon as good master workmen.

DISCUSSION.

Mr. McIlhaney: I would like to know how to breed to get a good foot. What experience I have had is that much depends upon how the hog is fed. I have seen fine hogs with fine bodies but poor feet. I am sure it is essential to breed for it if you are to get good feet, and I would like to know how to do it.

Mr. Casida: I think we make a mistake in not giving proper exercise while the pig is growing. We confine them too much. We get our pigs too fat before the feet have become developed. I believe if we would study more what is needed to make a good bone and foot, and then feed for it, we would succeed better.

Mr. Sydnor: I would like to know how, after a pig gets down in the feet, to get him up again.

Mr. (failed to get name): I had a hog weighing 400 pounds badly down in the feet. I trimmed his feet as soon as they grew out. By constant care and repeated efforts he improved, and was able to carry his weight easily and comfortably.

Mr. Smothers: Compelling the hogs to run over rough and stony ground, I think, is a good idea.

Mr. Vivion: Have had some experience in this line, and find sweet milk the very best remedy. We should, however, mate those having short pasterns in preference to those having long pasterns, if we would breed good feet.

This was followed by

TYPES OF PURE-BRED SWINE.

J. M. Welsh, of Laclede.

Mr. President and Gentlemen:

When I received notice from the Secretary of the State Association that your committee had assigned me to the duty of preparing a paper upon the subject of "Pure-bred Types," meaning, of course, types of pure-bred swine, I admit that I felt very sensibly that to perform such a duty correctly and satisfactorily would require very straight, conscientious and practical dealing throughout. This is a subject with which no mere novice or adventurer, or any person influenced by notions, whims or fads, or anything else but the best interests of every swine-breeder and feeder in the State, should deal to any extent.

I agree with the Secretary, that the subject is a broad one, and I am glad that it is broad enough to include the types of all breeds for

it is certain that excellence is not confined to any one breed. To try to present in a public way the essential features of the best types of pure-bred swine, and to set up a model worthy of close consideration, requires that the lines be followed very closely and very honestly by those dealing with the subject.

As the matter stands now, with the various breeds there are types enough for everybody, and many of them not very satisfactory.

There is a lack of uniformity, and perhaps some errors of judgment as to essentials. No doubt some of the absence of uniformity comes of carelessness and injudicious mating, while some of it is due to difference of opinion as to the best types of swine to produce.

It is clear, however, to all who have had the opportunity of observation, that considerable improvement is needed. While there are many good individuals of each of the valuable breeds, there is not that sure and fixed type in any of them that is desired. One obstacle in the way of advancement in this respect, is, that breeders do not all see alike, while some, perhaps, care little about breeding to any particular type; just so that pigs are raised and sold. Great responsibility rests upon the breeders of swine in this country, for to them is entrusted the improvement and moulding of the breeds of pure-bred swine for the very best interests, not only of themselves, but also of the farmers and stockmen, who depend upon them and pay them good prices above pound value for the work they should do. Ordinarily, the farmer, owing to his somewhat varied occupation, and the influence of the market on his products, causing him to increase or diminish his herds as he sees the future, has not the opportunity to give the very special attention required to mate and breed his herd to the top notch. For this reason he goes to the breeder for the finished type, and pays well for it. I will just say here that there is no type or quality of hog for the breeder and another for the farmer.

There are also some fundamental principles and rules of nature we cannot violate, nor fail to consider, if we would succeed in producing and maintaining a quality or type of hogs of great and certain value. We are not well acquainted with all the distinct and special features of some of the excellent breeds of swine, but some of the more essential qualities and requirements of which we shall speak will apply to all breeds. Speaking for the Chesters, Durocs, Poland-Chinas and some others, there is some excuse for the variety of forms to be found in each breed. It requires more time than has been given these breeds to build up and firmly fix a type that is entirely satisfactory to all. Very few generations of these breeds bring us down from the days when the somewhat mottled groups of these classes of swine

were denominated breeds. For one, the Berkshire has been of more uniform type, owing to its greater age. And yet the innovations that have been made (and I do not say to the detriment of the breed) have broken upon the uniformity of type the breed possessed at a time when it may not have been as good a hog as it is today.

What peculiar points and features should combine to make up the very best type of hog, may be matters of more or less compromise; but as conscientious and practical breeders, we cannot so compromise our ideal of the very best type of pure-bred swine as to fit the herds of any of us, unless it so be, but we should set our standard high, and lose no time in breeding to it.

There are certain points and qualities we should demand in hogs destined to be the sires and dams of pigs intended to furnish the country with so great a proportion of its food, and supply the farming communities of the great West with the comforts of life.

For market purposes, the kind or size of a hog in greatest demand is not always the same. There are times when hogs of larger size and well fatted seem to be the only kind wanted at all; and when the prices of such range from 50 cents to $1 higher than for hogs weighing from 200 to 250 pounds. At other times the smaller hogs without much lard demand the highest price. What we seem to need is a type of hog with sufficient range of size, according to its age, to supply the demand. Granting that we have this in most breeds, it becomes necessary for us to try to produce and maintain a type of hog that can be brought to the size in demand with the very least expense to the feeder. The work of producing and perpetuating such a type is largely that of the breeder. This is one of the reasons why we are called together at this time.

We do not feel authorized under the present circumstances to mention the particular points and make-up of individuals of the breeds with which we are not quite familiar. Nor have we the time nor the disposition to speak of all the details of description of the best sires or dams of any breed. I will, however, mention some few of the more prominent features which seem to us to be necessary in the best build or type of sires and dams of the Poland-China breed, not only as relates to avordupois, but also to maintain and reproduce. For a sire of this breed we should require an animal of good life and stirring disposition, not nervous and touchy; full of vigor and an excellent feeder; a hog of great force, and powerful in make-up, with strong, distinctive features of a male. A hog of good length for his size, which should be large under good treatment—not too much of his length in midquarters. Large sknll, broad between the eyes, and also between the

ears; face slightly, not a good deal, but slightly dished. Nose not turned up, or snub-nosed, or cup-faced and pinched, which is a sure indication of breeding to what are called "chunks," or of small growth, such as incline to feed out and finish at light weight.

Clear, free, open eyes, not set too low. Strong jaw, with fairly large, solid jowl, braced against the shoulders. Ears in neat proportion to the head; well under control of the animal by a neat, clean knuckle; should be flexible, and the points tipped downward and apart. Forehead well up and the head set well up, not drooping nor tucked down. This is essential in a male. The neck should be short, strong and crested, widening quickly to the shoulders. He should have what we call powerful shoulders, with good lung and heart room. Wide between the fore legs, with prominent breast bone, well let down, showing good, wide brisket. Straight, broad back; not too much turned at rear; may be more so, however, than a female. Widely sprung ribs; good girth at heart, and flank nearly the same. Should be strong, extra strong, and full in the loins, and full, level sides and flank. Broad rump on top, at tail line across buttock, which should extend low down, giving long, square, deep and broad hams, extending from hitch at spine over and down near to hocks. Rather heavy, and medium to short, straight legs, and as good, short feet as you can get, with thick, strong fetlock toes. The legs should set squarely under him, giving the animal a strong, square walk. He should have a rather neat tail, set well up, with ability to curl at pleasure. He should be clothed with rather fine, glossy, smooth and somewhat thick coat, of the popular color of the breed, which at the present is black, or nearly so, with white points. Leaving this part of the subject for want of time, there are a few things that I should insist upon in selecting or judging a sire as a representative of the best type, that cannot be measured with a tape-line nor learned by the study of a score card.

There are many important things to be learned and known in the selection of sires that come of good and thoroughly schooled judgment, and a practical idea and knowledge of the qualities of a male, to insure the very best results in breeding. Aside from the most desirable points to be found in the general type of the breed to which he belongs, he should possess in full degree that proud and robust conformation peculiar to the noblest specimens of his sex, and which indicates the essential qualities of constitution, force and character of a great thorough-bred, with ability to stamp his great features upon future generations.

For a dam I should modify this partial description, giving a smoother and more even mold, with more equal balance throughout. For right here is the beauty and pride of the swineherd. The dam should possess a smooth, straight and level build, of good size, broad in back, carrying her width well back to rear. She should be of good length, with strong level quarters. We may allow some less bone, perhaps, and apparently fuller and rounder muscle. A little more shortening of head and slightly more dishing of face may be expected; but she should have the same clear, open countenance and broad skull, with firm jaws and more jowl. I would not select a dam of loose build; room to spare; which is an indication of weak, flabby muscles without and within, often disappointing in farrowing, as they do not respond readily to the pains of nature.

Besides, this would not be a good type of hog. I should want a dam to be very strong in the loins, and, above all, she should possess a good, enduring constitution. She should be an excellent feeder, easily fattened and a good milker. She should move with a smooth, even carriage, and should have a mild and steady, but firm disposition. Both sire and dam should fatten readily at any age; for a well-bred, well-fed Poland-China, or pig of any breed, is expected to increase in weight very rapidly.

While we have not the time, and it has not been our intention, to speak of all the points and details going to make up an individual hog of the best type, we have tried to give some general ideas gathered from experience and observation. The breeding of swine to the best type, and to perpetuate the qualities in our herds, is a most interesting occupation—requiring not only a correct knowledge of what that should be, but also a willingness to labor faithfully and honestly for its accomplishment. Simply buying a few full-bloods, and regardless of their merit, breeding them for the greatest possible number that can be raised and sold, and remaining satisfied with that kind of success, will not near do. On the other hand, it is little better to try to follow every fad and fashion, and perhaps only succeed in spoiling the improvement we have already made in our herds, by the induction of blood that has for its chief merit the fact that it has been swapped about between partners and neighbors at extreme prices; and after all the craze, this same hog would not dare to meet competition among hogs that are really good ones. We would not be understood as objecting to a good round price for a great hog; nor do we expect to find all of the best animals in competition.

All breeders do not advertise the same way. Nor does the same breeder at all times. What we are speaking of is the importance of

exercising good judgment, great care and honest intention in the selection and mating of breeding stock, for the best results.

Some may wonder at us for talking about the kind or style and type of hog to produce and maintain, since the National Association of experts has fixed all of that, in its standard of excellence, and its numerical division, giving to each division its special value. But I do not understand that the projectors of the score card, nor the association adoping a standard of excellence, have ever claimed that their work even closely approximates perfection, or that it ever was intended to outline an animal of the very best type that it is possible to produce. It, however, does call our attention to some of these essential points or divisions of a hog supposed to be of the best type of present attainment, and places some value on each of these divisions, so that with its use an awarding committee is not permitted to rest its decision on some one or two special and favorite features which the hog may possess.

As to the value placed upon each division by any adopted score card, we are all aware that it is a result of opinion, fancy and compromise, and its best friends tell us that its successful use is the ability to place a proper and correct value on each point. The standard of excellence, with its score card divisions, possesses no claim to any authority whatever, further than it may be accepted by breeders. But with its weights and measures, it does insist that each animal should possess some essential parts and proportions to excel in competition. It takes the animal as it finds it in the show yard, and without inquiry as to what its occupation or destination may be, it applies its rules, which are supposed to be of sufficient flexibility for old and young animals, to each individual in competition, and foots up the findings for final comparison, insisting all the while that each division of the animal shall and must receive its due credit in the result. This does not include many of the special features and qualities that cannot be measured, but always exist in the unity of parts, sexuality and character of outlines of a sire or a dam of the best type of the breed. These are qualities that are recognized only by the intelligent and observing breeder. So that it may be possible for an animal to score fairly well and yet be deficient in many of the essential breeding features.

We must speak for our encouragement of the progress that has rewarded the breeders and brought success to the feeders of swine in this country. We shall not for one moment be discouraged nor deterred from making further advancement, and breeding to a still higher standard and better type, by so-called "hog men," who, forever living in the past, are jealous of the present and future, and con-

stantly telling us of the fine specimens of hogs their fathers used to raise away back in Ohio and Virginia, and that perhaps the first year on beech-nuts and their neighbor's corn-field, and the second partly on each other, and used to get so fat they could not stand up; and with the next breath they tell us how they could drive these hogs clear to Baltimore, they were so strong and healthy.

Having lived, at one time, upon a farm where growing, fattening and packing hogs for the market was one special part of the business, and being near to one of those drove roads leading toward Baltimore, I have had some opportunity of observing and knowing the kinds of hogs they raised, and how well the fat ones walked to Baltimore. While some were better than others, it is true that, as a general rule, the hogs that were from two-thirds to three-fourths fatted could scarcely walk at all; while those in a condition that we would call finished for market could not stand up, and they were not always fed entirely on corn. It was not unusual to see a lot of hogs in a feed lot, where from one-half to two-thirds of their number were unable to stand on their feet, but sat on their rumps, their legs and feet unable to bear up even the light weight of two-year-old hogs at that time. It was not in their nature to fatten to any great extent, and their legs and feet were not able to carry them if they should. "They were not built that way."

With the improvement that has been going on, we have in the various breeds some types of hogs vastly stronger in build and constitution, readily fattened at any age, and with the ability to carry the great weights that are put upon them, and withal very profitable to the grower and feeder. Still there is room for advancement.

The subject is a broad one, and, as I intimated to the secretary, if enough has been said to stir up discussion the end will be attained, and we will get the desired information.

DISCUSSION.

Mr. Canaday: We can vastly improve our stock by improving the type.

Mr. Southworth: I attended the World's fair, and was told by the chief officer in charge of the swine department that it was not the large hog that brought the best price, but rather the medium size.

Mr. Penniston: I have a standard of my own, and can hardly describe it in words.

Mr. Falk: I would prefer a type such as could be marketed young if desired, or kept for a later market and a heavier weight if the market justified.

Mr. Smothers: I want a type that will fatten at eight months of age, or can be kept until eighteen if necessary.

Breeders' Correspondence—How to Conduct It.

George P. Bellows, Maryville, Mo.

Notwithstanding the large number of sales of swine that are yearly made at our State and county fairs, the great bulk of the pigs raised are sold by mail or direct correspondence between the farmer, who has perhaps never seen the breeder or his herd, and the breeder, who knows nothing of the professional skill, tastes judgment of the farmer, or brother breeder, as the case may be. It is inevitable that in transactions of this kind misunderstandings, and occasionally downright dishonesty, will occur, for which one or both parties are to blame; but the average buyer, not professional breeder, cannot afford to spend more money in traveling expenses than the pig should cost in cash, neither can the breeder afford to hunt up customers in person; therefore their mutual acquaintance must be made through the advertising columns of some agricultural or breeders' paper, and the actual business done through correspondence. Therefore the breeders' correspondence is a very important feature of his business, and should be of great interest to him, and attended to with strict and unvarying promptness and care. The business of breeding pure-bred stock, above all others, where lasting success and sound reputation are to be achieved, must be conducted on business principles; the chief corner-stone of which should be honesty of purpose and absolute integrity. To be a good salesman is as necessary to success as to be a good breeder. Many breeders who have the ability to select, properly mate, care for and grow a superior class of stock, fail to make the success, from a business standpoint, to which their ability as breeders entitles them, simply because they were poor salesmen; while on the other hand, another breeder with no better stock, perhaps even not so good a herd, will, owing to his superior ability as a salesman, do well and prosper.

In this business, in order to be a good salesman, and to get and hold customers, it is very necessary that the correspondence be well managed, and conducted in such a manner as will command the inquirer's attention, respect and confidence. To do this it is not absolutely necessary to be able to write a fancy hand; yet a plain, clear writing that does not necessitate the recipient to lay the letter before a calligraphy inspector for translation, is most satisfactory to him, we

may be sure. Neither is the ability to formulate beautiful sentences required, but the great secret depends on the judgment or ability to size up your customer, determine from his letter what he wants, and then if you have it in stock, be able to so accurately and fairly present it to him, that he will conclude from your letter that you are a man that he can trust, and the result is he gives you an order. And here I would say, never in any way should the breeder or seller missrepresent his stock to a probable buyer. To be sure, he knows better than any other man the breeding and quality of his stock, its ancestry and the inheritance, the methods of feeding, the shelter conditions and care it has had, its merits and defects, form, age and weight, and can therefore forecast with considerable accuracy what its future developments will be in the hands of a judicious feeder. For this very reason he is liable to honestly over-estimate the merits of his own stock, consequently he should, in describing them to parties at a distance, make some allowance for this possible over-estimate, and describe them as not quite so good as he really thinks they are.

In fixing the price, he must consider both the animal and the buyer. Of this latter, we know there are two distinct classes first, the breeder who will want to sell the produce to breeders, and the farmer who will want to sell the produce to the meat market. The first will pay a fancy price for fancy points, such as the best accepted color markings, a fashionably turned ear, a peculiar twist in the tail, absence of swirls, or the descent from some hog that was a great prize-winner, because it possessed these points to a great degree of perfection; while the farmer will only consider the hog's ability to eat, digest, assimilate food and speedily turn it in to pork that will bring the highest market price.

But the buyer. if he is an intelligent buyer (and the majority are), knows what he wants and should so state it. If he is a breeder himself he should say so. If breeding for the market that should be stated, and in this way would the correspondence be greatly simplified and the percentage of dissatisfied customers materially reduced. I do not believe any one can lay down a hard and fast rule for the breeder's correspondence that all may follow with success; because each breeder has his personal ideas and notions peculiar to himself, which marks his individuality and gives room for originality, both in thought and presentation. However, we have a few more suggestions, which, it seems to me, if generally followed would greatly assist the breeder in conducting his correspondence, and at the same time lighten his labors.

First, he should provide himself with appropriate and neatly printed stationery, consisting of letter heads, envelopes, business cards and shipping tags, providing a stencil is not used for marking crates. What we would recommend would be to compile a catalogue of the breeding herd, giving in the announcement a brief history of the herd, its founding, your object as a breeder, etc.

Following this, present first, in tabulated form, the extemded pedigree of your herd boars, then the breeding portion of the herd only. Would further recommend giving under the pedigree of each animal, in brief and concise form, its description and show record, if any. By having a catalogue you are able to give your customers a complete outline of your herd, and at the same time impress him with the standing of your herd and the character of your business. You also save much time which is valuable, by not having to write pedigrees, descriptions, etc., in full to each inquirer. It is only necessary to make reference to the sire and dam of pig, as found in the catalogue, give date of farrow, write special description of the pig, set price, and add such other statements as the individual case may suggest or require. If the sale is not made, your catalogue remains in the hands of a man that has been thinking of buying, and through it he may possibly become your customer at some future time; thus it becomes a means of advertisement and helps to roll the ball of your growing reputation around; thus it serves a double purpose.

Again, the breeder should arrange to receive his mail as frequently as possible, and then by all means answer all correspondents promptly. Keep all letters received on file, and if a copy of your answer to each is not taken, you should at least make note of the date of your reply, and the principal points contained therein, on your correspondent's letter, for future reference; thus saving contradictory statements made at different dates—a thing which destroys confidence, and shows either gross neglect and carelessly kept records, or a degree of dishonesty on the breeder's part. Another thing I would suggest is that a list of names and postoffice addresses of every inquirer be kept in a book, and that such be sent a circular or short personal letter once or twice a year. This cultivates acquaintance, inspires a friendly feeling, and gives each party to understand that you are in the business to stay, and are looking after its interests. There are other features of the breeders' correspondence, which I shall not touch upon, but which I trust will be brought up in discussion of this subject. One which I might mention is the best method of treating with dissatisfied customers.

Thanking you for your very considerate attention, etc.

"Breeders' Correspondence and How to Conduct It" led to a lively and very profitable discussion, and is a matter that is worthy of the serious thought and study of every man who has to do business with others through the mails. One must ascertain with distinctness what a customer wants, and then tell him precisely the kind of animal he has to ship; and this most be done with clearness and accuracy, and with an effort to tell the truth and nothing but the truth. Few farmers make first-class letter-writers, and yet it can be done, if done leisurely and carefully.

The Proper Age for Mating.

By J. W. Benefell, of Linneus.

I do not know that I can say anything on this subject that will either interest or benefit you, but will simply say what I think about it. I have had good results with gelts that farrowed at ten and eleven months, but always have better results with young sows that do not farrow until they are fourteen or fifteen months old. The best brood sow that I have was eighteen months old when she farrowed her first litter. She had ten pigs and saved all of them. There were nine good pigs and one small one, and it was good as far as it went, but there was not enough of it. Her next litter she had eleven and saved ten, all good pigs, and she never has had less than nine nor more than twelve. It is very seldom that she loses a pig, and they are always strong and thrifty fellows.

A full sister to this sow farrowed her first litter at twelve months, had six pigs and raised four. Her next litter she had seven and raised six; and she never farrowed over seven pigs, and very often lost two or three. She never farrowed more than half as many pigs as her sister, but she has lost more and does not raise as good ones, even by the same boar as those of her sister. Now just what makes the difference in the two sows I am not able to say. They each have the same treatment in every respect. The one that farrowed her first litter at eighteen months old is the largest sow, and I think her pigs are always a little the best.

Now, whether the age at which a sow is bred has anything to do with the number of pigs she has or not I cannot say, but I believe that if we would not breed our sows till they were at least twelve months old, we would raise not only more pigs, but better. I cannot but think we breed many gelts too young, and that many a good sow is spoiled in so doing. This is my best judgment, and I would like to hear that of some older and more experienced breeders.

Permit me to close by expressing the opinion that the year 1895 will be a good year for the breeder who has an abundance of pigs, especially if they are good ones; so raise all the good ones you can. I am going to try to raise better ones than in the past; am having them built to order, and think they will be just what I want. Don't be afraid that you will not sell them, for I think that good pigs will bring good prices, especially if you make the fact that you have them known through "Colman's Rural World" and "Live Stock Indicator." They will very soon start the customers after you.

DISCUSSION.

Mr. Sydnor: My own experience is that we should wait until the sow is at least twelve months or more old.

Mr. Southworth: I have not had much experience in this line, but what experience I have had is that brood sows should be from twelve to sixteen months old before breeding.

Mr. Allen: I find it best to breed the earliest gelts for February or March litters and those younger for later litters, when they can draw their supplies from the grass.

Mr. Dorsey: There are two reasons why a sow should have age before her first litter. The first is that she would be a larger and better sow. Second, she will be more likely to have more pigs, and is certainly more able to take care of them. There is, however, an erroneous idea abroad that an aged sow will bring better pigs than a young sow. I have also known some persons to destroy the first litter and breed at once for the second litter, saying the second would be much better than the first. I do not think there is anything in this idea.

The discussion here drifted into the matter of controling the sex, with the usual result of all such efforts, viz; failure.

Mr. McIlhaney had such excellent results in breeding young gelts to young males, that he proposes to continue the practice until he sees bad results.

Secretary Blake believes we are reducing the size of the Poland-China by breeding from too many immature and undeveloped sires and dams. We lose size, constitution and vigor, or else all laws applicable to other stock and the human race must be an exception to this class of animals I would always try to have maturity on one side.

We make another mistake often in disposing of a brood-sow at three or four years of age. If she is a good one, keep her as long as she proves good, no matter what her age. There are some noted sows now regarded of great value, that are ten and twelve years of age.

Outside Thoughts for Swine-Breeders.

By L. A. Martin.

Mr. Martin delivered an address on "Outside Thoughts for Swine-Breeders." Mr. Martin said that he was not so conversant with the care and conditions of four-legged swine as the gentlemen he was addressing, but he was certain of one fact: that is, that the four-legged hog was not avaricious, which was more than could be said of his two-legged namesake. A fat hog would, if surrounded by tons of the most appetizing food, eat his fill and then lie down and grunt in sublime satisfaction. If a hungry razor-back intruded, the well-filled porker would only grunt his greeting and allow the new-comer all the food he could devour. Not so with man: the rich withhold their goods and reach out for more.

Mr. Martin recognized in the faces before him fit representatives of the great thrifty middle class of society, through whom all reforms come, and with whom all social reforms worthy of the name originate. The speaker then discussed economic questions as they relate to the gentlemen of the convention and the class they represented. He was frequently applauded, and made an interesting address.

How to Keep Swine Healthy.

By T. A. Harris, of Lamine.

This question has puzzled the most of men, and among them some of the best and most experienced. Under natural conditions no animal on the farm has a greater degree of vigor than the hog, but under unnatural conditions none are more apt to become diseased. Some men find them so unhealthy on their hands and under their management that they cannot keep them with profit. Others, again, labor under the impression that to keep hogs in a state of health they must be constantly dosing them with physic of some kind, patent or otherwise. They apply the same rule to themselves, believing that both health and life are found in the patent medicine bottle. When I read of a breeder giving his hogs this or that medicine as a preventive or cure of some known or unknown disease, I at once infer that there is a screw loose in his management or judgment, or both.

The trouble with us is that we know too little of the nature of medicine or the effect it is likely to produce; hence it is just as apt to be injurious as otherwise, and the end sought entirely defeated. I believe it the best plan to study the nature of the animal and the conditions necessary to health, and if these are not forthcoming one can hardly expect health in his herd, no matter what the medicines employed. That hogs can be kept healthy without drugs we know, since the continued success of many demonstrates it.

We aim to keep salt and wood ashes within reach of our hogs all the time, in the belief that it destroys worms and prevents costiveness; and notice that they consume more ashes when the ground is frozen and when pastures are the rankest. But we do not believe that these will cure all the troubles that swine flesh is heir to, and much less serve as an antidote to poor shelter, poor food, and generally mean treatment. Sickness and unthrift are the usual results of poor food and neglect, and the reverse of this treatment must be adopted if health and thrift are to be expected.

It has been our experience that the purer, fresher and sweeter the food the better the results, and this notwithstanding the apparent teaching of ages that anything was good enough for a hog. In consequence of the practice of this latter theory, the farmers of many counties lose thousands of dollars annually; and the loss in the value of hogs to the country every year reaches so far into the millions of dollars as to be really startling. It is high time that breeders and feeders understood that success in the swine business can no longer be obtained by following the methods of long ago, in times when they bred, fed and cared for themselves.

The hog of today has been bred so as to enable it to quickly convert our immense crops of grain into meat in the shortest possible time, and at a profit to the feeder. His digestive track has been lengthened and his capacity increased, so that in place of needing two years on grass, mast and corn to mature, he is made to do the work in eight months on grain, grass and milk. To do this he must be born, reared and cared for in a healthy condition, and under circumstances congenial to his nature, his likings and his appetite.

Sour food, irregular feeding, and a surplus of too much corn or anything else, is very apt to produce indigestion, and through it many other diseases, all of which are inimical to successful business. The hog should always be fed only sweet food, and be given time to thoroughly masticate that which calls for it, and should have at least two meals a day. He should never be either overfed or stinted; should have clean, fresh water at hand all the time, shelter both winter and

summer, and a warm, dry bed to rest in at will when warmth is necessary. The bed should be kept clean and dry, and free from dust; should be cleaned regularly, and air-slaked lime dusted on the floor every time before the bedding is put in. We sometimes use carbolic acid, but find lime cheaper and more lasting. We always give our hogs the run of a grass lot when possible, for both grass and exercise are essential to health.

DISCUSSION.

Chenoweth: We clean up our lots quite often. Use Haas' Remedy. For bedding we prefer slough grass. Corn-stalk and straw do very well.

A. Allen: I do not use the same lot more than two years, and try and use a different one for summer than winter feeding.

Mr. Boles: I prefer a bed on the ground and a movable house.

Mr. Dorsey: I prefer, for health, a bed of straw or fodder. Scrape up the rubbish and refuse once or twice a week and burn same. Give them ashes and a little lime. I use a good deal of salt when I burn the cobs.

Sec. Blake: Half a pint of crude carbolic acid to a bucket of water, and applied to the cobs when they are thoroughly red, is excellent. When cold, put cobs in a dry place and feed at leisure. Your pigs will be free of worms.

W. M. Penniston's remedy for destroying worms in swine: To every 25 head of hogs or pigs take: Calomel, 3 oz.; santonine, 1 oz.; make a mash of boiled slop-stuff and mix the calomel and santonine thoroughly through with the hands. Divide into two doses and give night and morning. This is to be followed on the evening after the second dose is given by one lb. of Epsom salts dissolved in water and given the hogs to drink. Keep hogs in a dry place for two or three days and until they get fully back on their feed.

Artichokes—How I Grow and Feed Them.

By Jno. R. Goodding, of Goodding Bros., Atlanta.

First: How I grow them. I fit the ground thoroughly by plowing deep, and harrowing well to make it fine. Good, rich soil is preferable—such as will grow good corn or potatoes. I select the tubers of medium size and cut to at least two eyes; furrow the ground off in rows with a one-horse plow, three and one-half feet apart, and drop

the seed as prepared, one piece in a place in furrow, 18 to 20 inches apart, and cover with one-horse diamond plow, or a two-horse shovel cultivator. If with the cultivator, turn shovels to throw the dirt in same so as to ridge dirt to dirt when plowing the last time.

Time for planting for best seed results is as early as the ground will do to work in the spring, but will do well planted any time up to last of May. Some plant them late in the fall to have them ready for spring. I have never tried that plan, but as freezing (while in the ground) does not injure the artichoke either from growing or for feeding, I believe it would be a successful time to plant.

As to their cultivation, I cultivate them just as I do corn, with a common two-horse cultivator, usually about three times over, unless it be a wet season, then it may require more to keep the weeds in check. Artichokes are very prolific; will yield under favorable conditions, 500 bushels per acre, or even more. As dry as the past season was, our artichokes yielded over 200 bushels per acre.

The way I feed them is to open a gate or gap from the hog lot and let the stock run to them at will, and do their own digging, which seems to be a great pleasure to them. We use the artichoke lot to take the place of the clover lot when the clover has gone into winter quarters, and find it works admirably. If our artichokes are all in one piece we run a temporary fence across it, that we may save part of them for early spring feed before clover starts, and it is only the most extreme winter weather that the hogs will not get sufficient supply of them to keep thrifty, and in healthy condition; and for this extreme weather we usually have a quantity in the cellar to feed out as a morning or noon ration, which I find to be a great benefit to our herd of Poland-Chinas, and I presume it will work equally well on other breeds. Will close by asking you all to give them a trial and be profited thereby.

DISCUSSION.

Mr. Waters: They are experimenting on the feeding of artichokes at the Experiment station at Columbia, trying several lots of hogs, feeding differently each lot.

Sec. Blake: I would not expect to hear of any great success from those experiments, as the artichoke is not recommended or used as a food for fattening purposes, or any other than as a green food in winter time, or, as Mr. Goodding says, to take the place of clover in late fall or winter, after the clover is gone, and in the early spring before the clover comes.

Mr. Chenowith: Have had some experience; first season they did well, and our hogs did well on them. We plowed through them

and thinned them out. They were so easily gotten rid of that they were gone altogether, almost before we were aware of it.

Mr. Sydnor: I raised a few. My hogs eat them all up. I consider them excellent feed for brood sows and pigs in winter and early spring.

Mr. Ingram: I raised some artichokes; found I could raise about two bushels of them to one of potatoes.

Pres. Vivion: I planted some, but not getting them in early the tubers did not seem to grow until the late rains came on, and then they did splendidly. My hogs have done much better than ordinarily while feeding them.

Mr. John Morris: I was told they would save the grass from being rooted up by the hogs. I planted some and found my hogs did well on them, and did let my meadows and pastures alone.

Mr. Null: They will not mature if planted too thick. I plant in rows four feet apart, in good, rich ground. The following year harrow over the ground well, and cut out with a cultivator to usual width.

Leading thought of the paper—A green feed for winter.

Leading thought of discussion—Same as in the paper, and the additional fact that they are not hard to get rid of when desired.

Hog Cholera and Swine Plague.

Dr. John S. Meyer, St. Joseph, Mo.

Mr. President, Ladies and Gentlemen:

I have been requested by the Secretary of the State Board of Agriculture to be present at this meeting of the Missouri Swine-Breeders' Association, and give an address on some of the diseases of swine. For this occasion I have selected the subject of "Hog Cholera and Swine Plague." These two diseases are very destructive to the pachyderm species of the United States. It is estimated that the losses from these diseases reach from $10,000,000 to $25,000,000 annually. Every one acquainted with the raising of hogs knows how disastrous these contagious diseases are. Owing to the resemblance of the two diseases, and the impossibility of distinguishing between them, except by scientific investigation, it is impossible to say what proportion of this loss should be ascribed to one disease and what to the other. Both diseases are known to be common, and spread by infection.

Hog cholera is particularly fatal to young pigs, and often attacks them when the older ones escape. I have personally seen such out-

breaks where the young pigs all died, with the exception of one or two; while the older ones had either mild attacks, or apparently escaped the disease altogether. It has been proven by the research of the Bureau of Agriculture that the older animals have a greater power of resisting the virus than the younger ones. This power of immunity is also contributed to those who have passed through an attack, which is proven in this way: If hog cholera breaks out among a herd of swine, and is checked and apparently eradicated by medical or thorough hygienic measures, the hogs thus saved are capable of resisting the contagion on the premises; while purchased hogs, that have not been exposed, will, when put with the exposed or recovered ones, contract the disease and die. This shows that the virus has remained upon the premises, and the hogs have been saved, not by the destruction of the contagion, but by keeping the infected hogs alive until they become immune. This is an important fact, and one that should be kept constantly in mind in applying measures of prevention. The virus of hog cholera is very tenacious, more resisting to the conditions which affect the vitality of bacteria than that of swine plague, and it is also more easily spread and communicated to healthy animals.

Swine contract hog cholera by taking the virus into the body with drinking water, inhalation of the air, and occasionally through flesh wounds. On the other hand, the virus of swine plague is generally, if not always, contracted by inhalation. The incubation period varies from four to twenty days. During this period the germs are multiplying, slowly and gradually overcoming the vital powers of the animal.

Symptoms.—These you are all possibly too well acquainted with to need description. Usually the first thing seen is a cough, although this is not always present. Again, one or more will be seen stupid, do not care to leave their beds, shivering, unwillingness to move, more or less loss of appetite; they have a tendency to hide away in their bedding, love of cold drinks, slow and difficult walking, ears hot and sore, eyes sunken and watery. There is usually constipation or bloody diarrhea. The breathing is more rapid than usual, and may be oppressed and labored in later stages. The skin has a peculiarly pinkish red or purplish appearance. There are sometimes eruptions on the skin which leave crusts or scabs of various sizes. There is a rapid loss of flesh, tottering gait, when finally the pulse becomes imperceptible, the victim is stretched out and gives occasional convulsive movements and expires.

Post-mortem.—The germs of hog cholera have a habit of collecting or growing in clusters in the blood-vessels, which leads to the plugging

up of the smaller vessels. This causes red spots where the blood leaves the vessels and collects in the solid tissues. These spots are referred to as congestions or extravasations of blood. They are common in hog cholera. In swine plague the bacteria are evenly diffused through the blood, never forming plugs. The spleen is generally enlarged from two to four times its normal size, is soft and engorged with blood. The blood extravasates frequently into the lymphatic glands, and particularly along the intestines, on the surface and in the substance of the lungs and kidneys, on the mucous surface of the stomach and intestines. The contents of the intestines are sometimes covered with clotted blood. In the chronic form of the disease the spleen is rarely enlarged. The lymphatic glands of the infected intestines are enlarged and tough. In the more acute cases lung lesions may be found, varying from collapse and œdema of the lung tissue to broncho-pneumonia.

In swine plague the lungs are often found inflamed and to contain large numbers of small points; these spots are known as necrotic foci. Inflammation of the serous membrane is very common in swine plague, and this may be found affecting the pleura, pericardium and peritoneum, accompanied with fibrinous, inflammatory deposits on the surface of these membranes. In hog cholera the first effect of the disease is believed to be upon the intestines, with secondary invasions of the lungs. In swine plague the first effect is believed to be upon the lungs, and the invasion of the intestines a subsequent process. Briefly reviewing these changes, we find that the most characteristic lesions of hog cholera consist of: First. Hemorrhages, particularly in the subcutaneous, submucous and subserous connective tissues, in the lymphatic glands and in the various organs of the body. Second. Ulceration of the large intestines. Third. Collapse of lung tissue, and less frequently broncho-pneumonia.

The most characteristic lesions of swine plague are: First. Inflammation of lungs, numerous small necrotic points in these organs, or a few large cheesy masses. Second. Inflammation of serous membranes, with fibrinous deposits. Third. Congestion of mucous membrane of intestines, or inflammation of the same, with fibrinous deposits.

Notwithstanding this clear difference in typical cases, there are many outbreaks where it is difficult to make a diagnosis even after post-mortem examination, because both diseases may be affecting the same animal at the same time, or the changes may resemble both diseases without being very characteristic of either. In such cases it is only by microscopic examination, and cultivation of the germs, that a reliable diagnosis can be made.

Causes.—Both hog cholera and swine plague are caused by bacteria. Hog cholera bacteria, when inoculated in minute doses, are fatal to mice, rabbits and guinea pigs; in large doses may kill pigeons. Swine plague germs are fatal to these animals and also to fowls.

Hog cholera may be produced experimentally. First, by exposing well hogs to diseased ones. Second, by feeding the internal organs of diseased carcasses or cultures of the germs.

Swine plague may be produced experimentally: First, by cohabitation; second, by injection, or inhaling virulent germs into the lung tissues. Both diseases are produced by injecting cultures of the respective germs directly into the blood-vessels. From the results of experiments with these diseases it has been concluded that the germs of hog cholera find their way into the bodies of swine with the food and drink and with the inspired air. Hog cholera germs are very hardy and vigorous. They are able to live a long while in the water of ponds and streams. They may live in the soil for at least three months, in accumulations of straw and litter for a much longer time. They withstand drying and other adverse conditions in a remarkable manner. The swine plague germs, on the contrary, are very delicate and easily destroyed. They soon perish in water or by drying. The temperature for their growth must be more constant, and every condition of life more favorable than is required for hog cholera germs. The hog cholera germs are not usually present, and must be introduced before the disease can be developed. The swine plague germs are most always present, and acquire sufficient virulence by encountering proper conditions on one farm, to spread to adjoining farms in the same manner as hog cholera. There are practically the same conditions to guard against in the prevention of the two diseases.

Diagnosis.—The first question that occurs to the owner of swine when diseases appear among his animals is, What is the disease with which they are affected? If several animals are affected with the symptoms already enumerated, and if the same disease has been affecting hogs on neighboring farms, we may decide that one or both of the diseases in question are present, since no other epizootic disease has been recognized in this country. If, on examining the carcass after death, projecting button-like ulcers are found in the large intestines, we know that hog cholera is present. It must ba remembered that these ulcers are not found in the acute cases, but in the sub-acute and chronic form, where life is prolonged a sufficient time for them to form. If there is inflammation of the lungs, and if cheese-like masses are found in the substance of these organs, the disease is probably swine plague. Small blood spots in the tissues, or scattered over the

internal organs, indicate hog cholera, while inflammation of the serous membranes indicates swine plague.

Prognosis.—The losses which result from outbreaks of hog cholera and swine plague depend partly upon the condition of the hogs—that is, upon their susceptibility to the disease—and partly upon the virulence of the contagion in the particular outbreak. If the animals are very susceptible and the contagion very virulent, the loss, even in large herds, may reach 90 to 100 per cent in those cases where the disease is allowed to run its course. In milder outbreaks, or with animals more capable of resisting the contagion, the losses vary from 20 to 60 per cent. Toward the end of an outbreak a larger proportion of animals will recover than at the beginning. A portion of those recovering will fatten, but others remain lean, stunted in growth, or never become healthy animals.

Treatment.—With all diseases of this class prevention is cheaper and in every way more satisfactory than medical treatment. The great aim of the people should be to prevent the spread of infectious diseases. A remedy which will cure every case is not expected. There has never been discovered a remedy for a single one of the infectious diseases of man or beast which will cure every individual attacked. Some forms of these diseases are so violent and rapid that the animals are dead before they are observed to be sick. Under such conditions the treatment should be confined to the apparently well animals. In many outbreaks the type of the outbreak is not so violent, and there is time to treat the sick animals, also the whole herd, after some members have shown that they are diseased. The latest experiments indicate that treatment, if properly applied, may be successful.

The most efficient formula which has been tested by the Board of Agriculture is the following: Wood charcoal, 1 pound; sulphur, 1 pound; sodium chloride, 2 pounds; sodium bicarbonate, 2 pounds; sodium hypo-sulphate, 2 pounds; sodium sulphate, 1 pound; antimony sulphide, 1 pound. These ingredients should be completely pulverized and thoroughly mixed. The dose of this mixture is a large tablespoonful for each 200 pounds weight of hogs to be treated, and it should be given once a day. When hogs are affected with these diseases they should be fed on light and easily digestible foods, changing the food often. Animals that are very sick should be drenched with the medicine shaken up with water. Do not turn a hog on its back to drench it. This medicine may be used as a preventive of these diseases. For this purpose it should be put in the feed of the whole herd. Care should be taken to see that each animal gets its proper portion.

Success or failure with this remedy depends largely upon the manner in which it is given. If it is improperly administered, or the hogs left out in cold storms and compelled to remain day and night in mud six inches or a foot deep, under the necessity of searching through this mud to find an ear of corn in order to get something to eat, the farmer might as well save his money and let his hogs die. To treat these diseases successfully, the animals should be kept dry and comfortable, with plenty of fresh air, but no drafts.

Sanitary Measures.—When hogs are first found to be affected with these diseases, the lot or pens should be disinfected by dusting plentifully with dry air-slaked lime, or by sprinkling with a five per cent solution of crude carbolic acid. The animals should all then be removed to new disinfected quarters. If possible, the sick and apparently well should be separated before they are moved and then put into different lots. Thoroughly disinfect these lots once or twice a week, and keep the hogs from stagnant water. By this treatment the hogs gain a marked degree of immunity. When new hogs are brought upon a farm, or when his own return from an exhibition, they should be kept in quarantine and not allowed to come in contact with other hogs for at least six weeks. When hogs which have gone through an outbreak are apparently well and thriving, new hogs added to the herd are liable to be attacked. For this reason, five or six months should be allowed to pass before any new hogs are purchased and brought on the premises, or before any are sold to be put among other lots of hogs. Hogs should not be allowed to run at large in the vicinity of railroads over which swine are transported. When these diseases appear on a farm, precautions should be taken to prevent the spread of the contagion. No one should go upon the fields or into the pens where the sick animals are and then go to another farm where the disease has not appeared. Experience shows that hogs kept up in pens, or in a small lot, are less subject to infection when cholera is in the neighborhood than those which are allowed to run at large in the fields. A small quantity of carbolic acid, three to fifteen drops, according to age, in the drinking water, tends to prevent infection, and may have a beneficial influence upon the course of the disease.

Hoping my fellow-hearers may gain a few profitable points from these remarks, I will leave the subject for your further digestion.

How to Raise, Feed and Sell Hogs at a Profit.

By S. Y. Thornton, of Blackwater.

Mr. President and Gentlemen of the Missouri Swine-Breeders' Association:

I have been requested to prepare a paper on "How to Raise, Feed and Sell Hogs at a Profit." I feel that there are men present who are older, more experienced and much more competent to write on this subject; nevertheless I will give some of my ideas.

The hog has been very properly called "the mortgage lifter." I have been raising and feeding hogs for market from my boyhood, with some degree of success.

I commenced on a farm with a mortgage on it for $1500. I had other stock, but paid close attention to my hogs, believing that by so doing I would sooner have a clear title to my farm. My object was soon accomplished. Then I bought a more valuable farm and mortgaged it for $3000. I stuck closely to my friend, "the mortgage lifter," and in a comparatively short time I cleared the record, and have come to the relief of some that were not on such intimate terms with my old friend as I have been.

To begin with, it is important to have large, hardy, prolific sows, and enough of them to raise at one litter each, a car-load when ready for market.

I find the "Duroc Jersey" to fill the bill exactly, but let every one have the breed that will raise the most pigs of the heaviest weight, in the shortest time. Breed for early spring pigs, and all within ten days or two weeks if possible, to a thrifty, well-developed boar (but never more than two a day to one boar), so as to have the pigs strong, hearty and near the same age.

As to crossing one breed with another, I will not speak; but it is important to have them all the same color as well as the same age and style, so they will be attractive to the buyer, and by so doing you will get 20 to 25 cents per 100 pounds more than if they lacked uniformity. Have each sow named or numbered, and record the date they are bred, and be prepared to care for each sow and pigs to themselves before she is due to farrow, for a little carelessness or neglect on your part at this time will cause you to lose more than you can make on what happens to get through all right. The sows should be in good order, but not fat.

Feed moderately until after the pigs come, and then increase the feed gradually, until they are a week old, when the sows should be on full feed. It is important to give the sow some slop before she

farrows to insure a good flow of milk. I have known pigs to get poor, and if the weather was cold, chill to death, because the sow hadn't sufficient milk, whilst if she had been properly fed for a week before they would have been all right. Feed the sow liberally on good slop and corn, and let her have access to the best pasture possible, for a litter of 8 or 10, and sometimes 11 or 12 hearty pigs make a great demand on the sow.

For early spring pigs a good growth of rye or wheat is excellent. When the pigs are three or four weeks old they will begin to eat corn, and should have it shelled for them. Have shallow troughs and encourage them to drink slop as soon as they will. Feed the sows liberally as long as they suckle their pigs and until they are in good condition. Sows so treated can generally be bred again when the pigs are a month or six weeks old. Feed the pigs well all the time, but during hot weather I think best not to feed too much corn. Feed near the water and shade when the weather is warm, but for the benefit of the corn or other crop, feed on a clover field or some field where you can utilize the manure, which is the richest of any made on the farm. If pigs weigh 100, lbs or more when you begin to fatten them, I think sixty days' full feed on corn on a good clover pasture will give a greater gain to the amount of corn fed than if fed longer.

Cater to the wants of the buyer and try to have just the hogs he wants, and if you succeed in so doing he will pay you the top price, and sometimes even more than they are quoted at. I have sold hogs on the market when the transaction did not appear in the market report, or be given as P. T. (private terms).

Watch the market closely, be posted as to all shipping expenses, and when you have set a day to start your hogs to market, if you do not sell to a local buyer, order your car, select your hogs with care so as to have just a car-load as near one size and style as you can.

Drive slowly and carefully, and see that none of the boys get in a hurry and whip or harry so as to break them down. Car them carefully and consign them to some reliable firm, whom you have advised of the shipment, and if you do not care to go to the city, go back home and attend to the next lot of pigs, which are two or three months old by this time. Thus, you have marketed one crop, and about the second day after shipping you will get the proceeds with which to pay off or lighten the mortgage on your home (if it is encumbered), and so you are on the sure road to independence.

There was no discussion on this paper, further than to emphasize the very strong points made by the author, as to uniformity of size, color, and thoroughness in handling. SEC.

Swine Feeding and the Dairy.

Levi Chubbuck.

MR. CHAIRMAN: In speaking on this occasion on the subject of "Swine Feeding and the Dairy," I of course recognize that I am addressing hog-breeders rather than hog-feeders, and my remarks will be shaped accordingly. It is announced at the outset that one of the most important qualities that the breeder wishes to impart to his pigs, which he is to dispose of primarily to raisers of hogs for breeding purposes, is good constitution and physical vigor; for, unless he does this, it will be a question of but a few years when he will have to retire from the breeding business. A well made and fattened pig, having soft, weak bone and low vitality, may deceive a buyer once in a while; may once in a while deceive a good many buyers; but every once in a while breeders of such pigs drop out of sight. A leading question, then, with breeders of fine-bred hogs is how to maintain and develop constitutional vigor. This, I maintain, can be largely done by the kind of food fed.

Pardon me if I state a few facts, doubtless familiar to all persons, but which are necessary to a proper development of the subject. The bodies of all animals are made up of three general classes of substances, viz., bones, flesh and fat. And these must exist in the body in pretty well defined proportions. Those substances must be developed from the food eaten and assimilated. Foods differ widely as to the chemical substances of which they are composed. Foods are made up of three general classes of substances—mineral matter, nitrogenous substances and carbo-hydrates and fats, the latter two being chemically similar. The mineral matter is in the ash left after burning, and is the principal component of the bones. The nitrogenous substances are the gluten of wheat (the sticky portion), white of egg and cheesy part of milk, and is that part of food from which the digestive forces of the animal make up the muscle or lean meat. The carbo-hydrates and fats are the starch, sugar, woody fiber and oils, and the portions of the food from which fat in the animal and animal heat is developed.

It is within the power of the feeder to change the character of the different substances of the animal body, and the proportion existing between them, by feeding different foods.

The purpose for which the animal is intended, and the age, will determine what should be the proper proportion of bone, muscle and fat-forming foods.

Young growing animals and those doing muscular work require a food rich in bone and muscle-making elements. Mature animals that are to be fattened and those not working want simply a fat-forming and heat-producing food.

It has been determined by extensive trials that a young pig wants a food having the flesh and fat-producing substances in about the proportion of 1 of the former to 5 of the latter; while the fattening hog will do well on a ration of 1 pound of flesh to 8 of fat former.

Corn, our great American stock food, has a nutritive ratio of about 1 to 9: that is, for every pound of flesh former it contains 9 of the fat former—too great a proportion of the latter even for fattening hogs. Now another fact in connection with corn as a pig food: By an experiment made at the Wisconsin Agricultural Experiment Station, it was determined that the thigh bones of pigs fed exclusively on corn-meal and water broke under a strain of 306 pounds, while the bones from pigs of the same litter, but fed on corn-meal and ground bone-meal, stood a strain of 407 pounds, thus showing that the corn is deficient in bone-making material—a fact which chemical analysis also shows, and which accords with every observing hog-feeder's experience. Thus we see that the breeder of hogs who is depending largely upon corn as food is pursuing a course which in a very few generations of pigs will result in animals very deficient in bone and muscle, two prime requisites for strength, vigor and vitality.

Are we to conclude from this that corn as a pig food is to be abandoned by breeders of pure-bred swine? By no means. Corn is the most valuable single stock food known, and if it were to be lost to us the calamity would be immeasurable. But its deficiencies must be made up before its full value is brought out. How shall we do this? By feeding it in connection with some substance which is rich in what it (the corn) is lacking, thus making one supplement the other. Is not that the principle you breeders follow in coupling animals? Why not follow it in feeding? And this brings me to the point I started for, namely, the profit that would accrue by combining dairying with hog breeding, or feeding, either.

Milk is a perfect food for young animals, it being what nature has provided. It contains all the nutritive elements called for by the system, in the proportions needed, and in such a condition as to be more easily available. Cow's milk has a nutritive ratio of about 1 to 4, just what the young pig wants; but if we remove the butter-fat in the

form of cream, we reduce the nutritive ratio to about 1 to 2, making a food much richer in the flesh-forming elements—the casein or cheesy part of the milk—than the pig requires. If, then, we will mix this skimmed milk, rich in flesh-formers, with corn, rich in fat-formers, and see that the pig gets enough mineral matter in the form of bone meal, wood ashes or the like, we will be able to produce hogs of well-developed muscle and bone of good fibre; and I believe no cheaper hog food can be produced than this combination.

Hence I see no reason why the hog breeders of this State should not become dairymen as means of producing the most healthy and vigorous breeding hogs, and the dairymen become breeders and feeders of hogs as the best means of utilizing the wastes of the dairy.

I will close by quoting an experiment made by C. P. Goodrich, a well-known dairyman of Wisconsin. He says: "I had some pigs that averaged 125 pounds each. I divided them to experiment with. Feeding corn alone, one bushel made 10 pounds of gain; feeding milk alone, 100 pounds of skimmed milk made 5 pounds of gain, a total of 15 pounds; 100 pounds of skimmed milk and 1 bushel corn fed together made 18 pounds of gain, a gain of 3 pounds over feeding the same foods separately. Fed separately, the gain at 4 cents a pound made the corn worth 40 cents a bushel and the milk 20 cents per 100 pounds. Fed together, the gain made the corn worth 48 cents a bushel, and the milk 24 cents a hundred. And I will add, the pigs fed on the combined food were unquestionably much the better developed animals, and more valuable by far for breeding purposes."

Pure Breeds vs. Cross Breeds.

FROM A FEEDER'S STANDPOINT.

By A. Allen, Kidder, Mo.

Mr. Chairman, Gentlemen: The subject assigned me by your worthy Secretary is "Pure Breeds vs. Cross Breeds, from a feeder's standpoint." Good, pure-bred hogs are worth a great deal more as breeders, at present, than they are as feeders; so the question narrows down to a low grade. Now, I suppose all of you know which breed I am going to boom, so to satisfy you will only say that I never quarrel with a man about his breed of hogs if he only has good ones of that breed. The market we are raising hogs for, weight and quality count for more than breed and pedigree. If the first two are all right they

never care for the others; while, if the first two are lacking, breed and pedigree count for nothing. In fact, you had better say nothing about pedigree to the buyers. Just take what they offer. The inferior pure-breds of any breed should be culled out and put in the feed-lot and fattened, and sent to market as soon as they are fat. The breeders are all gainers by having the trashy ones out of their way, and most of the inferior ones make pretty good feeders.

Now as to cross breeds: we don't like them too cross-bred. We never take much of a fancy to first cross of two breeds of hogs; too many of them resemble their remote ancestors—the scab, for instance. We always thought it a pity to spoil two good breeds to make a poor cross. Some farmers we know buy a pure-bred male every year. The first year they get a Berkshire, perhaps, the next year a Poland-China. They say the Berkshires and Poland-Chinas make a good cross for breeding purposes, and we may say their claim is fairly well sustained, thus far. But, when the next year they try a Chester-White and the next a Jersey-Red, by that time they have as precious a lot of mongrels as one would wish to see; all colors, shapes and sizes, and the unhappy mixer of breeds is heard to say: "It does not pay to buy hogs of those show fellows. They pamper their hogs too much for us common farmers to handle. Guess I'll keep that best boar pig I raised this year, for a boar." And after about two years of in-breeding, he finds his pig-crop about all runts, of all colors and sizes, a large amount of corn eaten and but very little gain to show for it, and when they get to market they bring the lowest price.

Now, the hog that we prefer for feeding is $\frac{3}{4}$ or $\frac{7}{8}$ blood — not so much matter about the breed if they are straight and healthy shoats. These grades have enough of one blood to finish evenly together, barring accidents, and will have the weight and quality to bring the top price or very near it when they get to market, and pay a fair profit for their food and care. The best individual hogs I have ever fed have been pure-bred sows that were barren. I have fed the barren sows of three breeds, viz.: Essex, Berkshire and Poland-China, and am satisfied that all made better gains and were of better quality for the food consumed than any grade or cross I have ever fed, and I have fed almost every known cross. In closing, I will say to my feeding friends: When you can buy straight, pure-bred shoats for but little more than cross-bred grades cost, give the pure-bred the preference. Take good care of them and you will have some hogs that you will not be ashamed to go to market with.

Secretary's Report.

To Officers and Members of the Missouri Swine-Breeders' Association:

It is now almost a year since we met to organize this Association. At that time we had neither name or members. When the organization was completed and constitution and by-laws adopted, we had enrolled the names of thirty-two members. During the summer months your Secretary, by issuing circular letters, personal appeals, and the assistance of a few good workers among the members, succeeded in doubling that number. By more recent efforts the number had reached a total of 80 when the call for this meeting was issued. Considering the low price of farm products, the scarcity of money generally, I feel that a fairly good result has been secured from the effort put forth.

The proceedings of our first meeting were furnished to the State Board of Agriculture, and by a resolution of your body I met with them and asked and secured their consent to publish them with one of their monthly bulletins at the expense of the State. The conference with the State Board of Agriculture was not only pleasant, but they expressed a wish to cordially co-operate with this organization and all other organizations that have for their object the improvement and development of the live-stock interests of the State.

These proceedings have been distributed throughout the State by your organization, and some demand has been made for them from parties outside the State. The high character of the papers read at that meeting, and the intelligent discussions following each, have led me to ask your executive committee for assistance (which they have cheerfully given) in securing a more thorough and complete report of the discussions of this meeting as they proceed. Last year a demand came from Oregon for a copy of our proceedings, before the meeting was held. This year we have calls from Nebraska and Illinois for them.

The financial condition of the Association is as follows:

February 28, 1894, to paid Treasurer, 32 memberships	$32 00
From February 28 to December 31, to 48 memberships	48 00
Total receipts	80 00

There has been drawn against this amount as follows:

March 16, 1894—By order of executive committee for expense of organization, voucher No 1	20 38
April to August—For stamps, envelopes and printing of same, April to August, including two sets of circular letters	7 97
December 14—To 500 circulars and postoffice stamps for annual meeting	11 00
Total expense for the year, including organization	39 30
Balance in treasury December 31	40 70

It will be seen by this, as well as by the report of the Executive committee, that only actual necessary expenses have been incurred.

The Membership.—The character of the membership is of a high order, and one any organization might be proud of.

Your Secretary received two cautionary letters during the year; as the parties referred to have not asked for membership, we have not had the trouble of declining them. Personally, every member is known to me with two exceptions.

Complaints.—No complaints sufficient to justify disciplinary measures have been brought to my attention.

Numerous differences of opinion as to certain values of stock and conditions of the same in some exchanges that have been made, have been brought to my attention, and assistance has been asked and cheerfully given to settling the same amicably and honestly without publicity.

Our members cannot be too careful in making exchanges of stock. Most of the differences of opinion that my attention has been called to have arisen from these exchanges. I have never seen a satisfactory exchange of this kind, when the parties had not seen the stock. There may be such on record, but the evidence is not forthcoming.

Our members cannot be too particular in keeping for sale only first-class stock. We must not be afraid to use the knife freely and often. And do not be dilatory about it. One good pig sold at a fair price will do more for your reputation in a community than two common pigs. Breed right, feed right, select right and keep the right constantly in your mind. I am exceedingly proud of the young men in Missouri that are taking hold of the swine-breeding business. They are a bright set of men, and will not consent to plod along the old and well-beaten paths when a "better way is shown."

I am not venturing too much when I say that two-thirds of the high-bred animals that have been added to the swine herds of Missouri in the past two years have been added by the young men of the State. All hail to you, to your good judgment, to your push, your energy and determination. Keep your eyes to the front. But one other State in the whole galaxy of states leads you. Forty-two are behind you. Rest not, cease not your efforts until that one has been put behind you. You have everything to aid you. It is true one other state may raise more corn than Missouri, but then corn and hogs, once so inseparable, are now each suing for a divorce, and piggy says, like some people, "Give me a change." "I'll take some wheat in mine."

The glorious climate of this State, the unusually short winters, the variety of cereal and vegetable products that can be raised by these young men, will show to them that corn is an excellent feed for

fattening hogs, but not by any means an essential for the growing pig. I am as certain that you will feed less corn to growing stock in the next five years, as I am that you will do everything connected with your breeding business in a more intelligent manner each year.

Go on, young men, the gray-heads here and elsewhere bid you God speed. We are not in it with you.

The statistics of the Agricultural department at Washington for 1893 show two things that demand the attention of breeders of swine in Missouri. They are: First, as I have before stated, that Missouri ranks second in the production of swine; second, and do not let the first fact close our ears to the second, which is that Missouri's losses are greater than those of any other State.

Too much climate and too few shelters. Too much following of the hounds and too little following of the brood-sows.

This may not be a pleasant reflection, but let us be honest with ourselves. Iowa and Nebraska are compelled to shelter and care for their swine, and their losses are less than Missouri's. Let us work a compulsory racket upon ourselves, and urge it upon our friends and neighbors.

It certainly is not for lack of material, for where straw and timber can be found, rude, cheap and yet good shelter can be made without necessary outlay of one dollar in money.

In article I of our Constitution the object of our Association is set forth under three heads. The third is, "to use our influence to secure proper judging of swine stock at fairs; and such other matters as may present themselves from time to time."

To this proposition I call your attention just now. 'Something along this line was accomplished last year in a few instances, but the work has not been done in a systematic manner.

To show what may be accomplished by thorough effort, allow me to refer to a similar organization. It is the Missouri State Poultry Association. It was organized in 1892. Hardly a fair of any size or note held in Missouri last year did not have an expert judge on poultry. How was this secured? By the poultry men and women going before the fair board of directors and promising a good large exhibit if they were furnished an expert judge, and nothing if the judging was to be done by a "picked-up" set of judges, who often did not know one variety from another.

If this much can be done for the poultry industry of Missouri, how readily something can be done to secure good judges for the swine breeders.

Should there not be an earnest, united effort in every county in the State to secure suitable judges? To do this the effort must be made at once, while the preliminaries are being discussed by the fair boards. I would suggest that the swine-breeders go before the fair directors in a body and urge this matter, supplementing the request with a promise to make the best exhibit of swine ever made at that particular fair. When you have made this promise, keep it as sacredly as it is possible to do. Do not be afraid you will be outdone by some competitor, but work up a good show, and if you do not get all the premiums, you have built up a desire in that locality for better stock, and your trade will be largely increased thereby, before the year is over.

State aid could be wisely used in developing this industry. The horticultural interests of this State have, by a combined effort, secured for the past six or eight years, from $2500 to $3000 each year from the State. Are we not as much entitled to recognition? If we do not ask it, we cannot expect to receive it! Other industries will ask the present Legislature for aid. Why should not we? There are other suggestions that I had in mind, but fear that I may be considered too suggestive, and have therefore omitted them. I desire to thank each and every officer and member of the association for the uniform kindness and courtesy that has been extended to me through the year just closed.

A. J. BLAKE, Secretary,
705 Olive street, St. Louis, Mo.

Discussion at Missouri Swine-breeders' Associaton.

"Some Drawbacks to the Breeding of Pure-bred Swine."

This topic had no response in a paper prepared for the occasion, but an interesting discussion was participated in. The President called out several breeders, who gave their experience.

Mr. Hill: The greatest drawback that I experience is that I cannot produce a pig that will show 100 points if scored by an expert.

Mr. Lail: My most serious drawback of recent date occurred about a year since, when I used petroleum very freely, externally, on a lot of brood-sows, to exterminate the lice. They were bred for February pigs. The sows were running on clover pasture, but every one lost their pigs, and some of them have never bred since.

Dr. Meyers: The oil closed the pores of the skin, shutting out the oxygen.

Mr. Penniston: My own experience is just the reverse. Have used it for years without bad effects. In fact, have used crude petroleum for kidney-worm and effected a cure.

Mr. Casida: I have had no bad results from the use of petroleum. I use the crude oil all through the year.

Mr. Hill: Have used petroleum for many years with good results. At one time, however, 11 out of 16 sows lost their pigs.

Mr. J. Waters: If we feed to secure bone and muscle in place of fat, we will find, I think, less drawbacks than a feed largely of fat-forming elements.

Pres. Vivion: I have used crude petroleum for several years, both externally and internally, and have never seen any ill effects. In fact, I don't see, hardly, how I could get along without it.

Mr. Sydnor: Have never used it extensively, but my pigs like it, and I think it a great worm and vermin destroyer. I prefer the black, crude oil to the refined, as it is cheaper, and does not evaporate as readily, and the pigs seem to like it in their feed.

Secaetary Blake: Would not use the refined oil, as it will sometimes blister a tender skin; nor would I use the medicinal oil kept by many druggists, as it is too costly. The common, crude oil, known to the oil trade as "Ohio oil," is the kind more commonly used, and can be purchased at 5½ to 6 cents per gallon by the barrel. Has always been regarded as non-injurious. However, in view of the cases reported here, those who have never used it would do well to heed the experiences of Messrs. Lail and Hill in its use upon brood-sows carrying litters.

DISCUSSION.

Mr. Allen: Would like to know the experience in feeding warm, soft feed.

Mr. Casida: When I feed warm, soft food, my pigs do not do so well—they begin to cough. I think it should be moderately cool.

Mr. S. P. Harris: We are now steaming all the feed and the pigs are doing nicely. We feed it warm. Have fed ground oats with success—sometimes put in a little grease.

Mr. Kester: I always feed dry oats. Don't want ground wheat or use it. I use shipstuff.

Mr. McIlhaney: My hogs eat ground wheat and thrive splendidly on this soft slop. I believe, however, in a variety of feed.

Mr. Smothers: I take to the mill only the best of wheat and have it ground, and feed it dry and have good results.

Dr. Meyers: Clover hay is a good feed.

Mr. Waters: Would not feed tonics, but nutritious food. Believe nature has her own remedy.

Mr. Penniston: I feed a limited amount of stone coal to my hogs every morning, and have for 24 years.

Mr. Sydnor: I think I have discovered that stone coal constipates my hogs. I much prefer charcoal.

Mr. Chitwood: Fix a place where sow can be separated from the litter at feeding time. Had a sad experience once in feeding fresh cow's milk to young pigs.

Mr. Casida: As pigs get older increase the feed of both milk and corn. Do not confine them a week after farrowing. The pigs and the sow both need exercise. Believe grass is best feed up to farrowing time. Good rye pasture is the best thing for a litter. When they can eat corn, give them some corn and soft food. Skimmed milk is best for the small pig—fresh milk too rich—then exercise and grass.

Mr. Brooks: Over-feeding is one of the things that gives bad results to the health of the hog.

Notes on the Swine-Breeders' Meeting.

By Rover.

The new members were well pleased with the meeting.

H. C. Sydnor was the best story-teller outside of the regular sessions, while Ed. R. Dorsey led them all while in session.

D. D. Smothers was too hoarse to say much except "the white hogs are getting there."

W. M. Penniston was the oldest member present, and would have made an excellent match for Judge Turley and Col. Harmon in form, size and talking proclivities. This is as much as to say they are all good ones.

G. W. Thornton, of Eagle, Indian territory, came all the way to join the association and sit at the feet of its many Gamaliels.

O. H. Southworth did well for a new member.

W. P. Brush came from Topeka, Kas., to attend the meeting, because he knows a good thing when he sees it. He made a most excellent report of the meeting to his paper, "The Kansas Farmer."

And, by the way, the agricultural papers were out in force, viz.: "Colman's Rural World," "Journal of Agriculture," "Live Stock Indicator," "Kansas Farmer," and "Iowa Homestead." The specialty papers were not represented in a single instance, but of course they will draw

largely on the above papers, as they always do. They will find "mighty interestin' readin'" in them, and enough to fill their columns for several months.

Already applications are on file for copies of the proceedings from Illinois and California swine breeders.

The entire proceedings will be published in proper form for reference in a few weeks. Parties desiring the same should send their membership fee, if they have not already done so, to the Secretary, A. J. Blake, 705 Olive street, St. Louis. Every member present that was enrolled on the 1894 list of members renewed his membership, with one exception, and this one will no doubt do so before his year expires. He always keeps up with the procession.

Members not present will, by reading the by-laws, note that their membership is only continued by a payment annually of the membership fee. We more than doubled our membership last year after the meeting. If every member would secure one additional member during the year, we would have the strongest Swine-Breeders' Association in the United States. The Secretary agrees to secure as many new members as the entire membership will secure in the next twelve months. An application from California is received while this is being written.

Sedalia and Marshall were mentioned for the next place of meeting. Saline county sent a good delegation to the meeting. We think the city south of the river that will furnish the best inducements for the next annual meeting will be the one chosen by the executive committee. It will be no small gathering, either; already the topics are being thought about and consultations had as to the proper parties to take charge of them. Scoring of animals and talks on score-card application will be a new feature of the next meeting. These subjects have already been assigned. The programme of exercises for next year will contain a list of the names of the members, and will be put up in a "souvenir style." Let all get aboard the Swine-Breeders' train for 1895.

With over a hundred breeders present, representing six distinct breeds, not a single word was said in the entire meeting that any breeder could take exception to.

The presidency went to a Berkshire breeder this year. There was a majority of the breeders that favored passing this office around among the different breeds from year to year. If this rule should be adopted, it would certainly preclude any assumption that the many were overlooking the few. We are glad to know that in the six leading breeds in this State, there are plenty of members who can preside with dignity and credit to themselves and the Association.

Secretary A. J. Blake and President Vivion were appointed a committee to advise with the State Railroad and Warehouse Commissioners to have express rates better regulated, and to provide for means to ship express by the shortest routes. This will affect the many cases where stock is kept on the road unnecessarily long, simply that the express agent may keep the shipment on the lines with which his company has agreements.

The Committee on Resolutions reported, asking the co-operation of swine-breeders of the State, tendering thanks to the Commercial club and to the Board of Agriculture, suggesting the appointment of a committee of two on expert judging, asking recognition by and an appropriation by the Legislature, asking that the State Experiment Station be placed under the control of the Board of Agriculture, that reforms be made in the management of the Agricultural College, and finally that more stringent laws may be adopted to prevent the dissemination of the swine plague.

The following officers were then elected for the ensuing year: President, S. P. Harris, of La Mine, Mo.; Secretary, A. J. Blake, St. Louis; Treasurer, H. C. Sydnor, Corder, Mo.; Vice-Presidents—For Berkshires, W. N. Brisky, of Independence; for Chester Whites, J. C. Canaday, of Bogard; for Victorias, A. G. McClelland, of Kirksville; for Yorkshires, J. M. Kennedy, of Bedford; for Duroc Jerseys, W. C. Addy of Parnell; for Poland-Chinas, C. G. Sparks, of Mount Leonard.

On motion, adjourned.

THIRD ANNUAL REPORT

OF THE

MISSOURI POULTRY ASSOCIATION.

Macon, Mo. Dec. 11-14, 1894.

INSTITUTE PROCEEDINGS, AWARDS AND BUSINESS MEETING.

(Exhibition of 1895 will be held second week in December. Location to be determined later.)

POULTRY INSTITUTE MEETING.

The first of the institute meetings announced to be held by the Association, under the auspices of the State Board of Agriculture, was held at the circuit court room in the court-house, on Tuesday night. In the absence of the president, A. J. Blake, of St. Louis, was asked to preside. In delivering the address of welcome, Mr. W. P. Beach spoke as follows:

Mr. President, Officers and Members of the Missouri State Poultry Association, and Members of the Missouri State Board of Agriculture, Ladies and Gentlemen:

Just why the distinguished but unmerited honor of bidding you welcome to the city of Macon has been accorded to me, by our local association, I have not been able to understand, and, probably, to you and to me, it may always remain a mystery. But the pleasant duty has been assigned me and I will endeavor to discharge it.

Away back, and it seems a long way back, beyond the great civil war, among the fancies, aspirations and inspirations of boyhood, somehow or other, I cannot now recall, this homely agricultural proverb got fastened upon my youthful imagination: "He who causes two blades of grass to grow where but one grew before, is a benefactor of his race"

And then I pondered: "Well, I don't suppose I can ever be a George Washington, a Francis Marion, a Benjamin Franklin, or a Henry Clay; but I believe I can do that much."

And, after all, ladies and gentlemen, the practical application of that homely sentiment is the chief influence of the world's progress.

It was, comparatively, but a few years ago, in this grand domain of Macon county, that the "scrub" horse, the "scrub" steer and the "scrub" hog constituted the live-stock of the farmer; and the "scrub" chicken constituted the poultry of the farmer's wife.

Now their places are occupied by the fleet trotter or magnificent draft-horse, the ponderous Shorthorn or the creamy Jersey; the massive Poland-China or the delicate Berkshire; and last, but hardly least, the beautiful, symmetrical, diversified and profitable breeds of improved poultry.

We have gathered here, in this month of December, in the year of our Lord 1894, from the valleys and hills, the hamlets and cities of our beloved Missouri, to specially consider the poultry interests of our State. We have brought together the best products of our poultry yards, to compare them and to award the most worthy the banner inscribed "Excelsior." And in this hall we have met tonight to propose and discuss some of the practical questions that confront us.

And now, at the outset, let us endeavor to comprehend the relative importance of the industry we represent.

The horny-handed farmer who toils in the hot summer sun plowing his corn, probably considers the poultry which his good wife looks so carefully after a small basis of income.

True, that good wife buys the coffee and the sugar that sweetens it; she saves money to purchase the organ for growing girls; when Johnny wants a new overcoat in the fall, perhaps he has to depend on mother to get it; and God and that good wife only know how many comforts and luxuries come to that home chiefly from the poultry yard. But, as that good farmer carves his luscious Thanksgiving turkey, surrounded by his happy family and friends, some guest who has studied poultry statistics tells the old gentleman that, considered from the cold standpoint of dollars and cents, the poultry interest of his county and State is among its most important industries.

I have been at considerable pains to ascertain and compare the chief industries of this county of Macon. As near as I have been able to approximate them, they rank somewhere as follows, annually, making a reasonable allowance on each item for home consumption:

In the production of coal we rank as the banner county of the State, and the value of our output of that mineral during the past year was	$600,000
The value of our corn product is estimated at the same amount	600,000
Then come our cattle	800,000
Our wheat	300,000
And our poultry	300,000
Hogs	250,000
Butter and milk (chiefly home consumption)	250,000
Horses and mules (estimate for '91)	100,000
Oats	100,000
Apples (in our best crop years)	100,000

"Young man," exclaims the old farmer, "aren't those figures all guess-work, and awfully wide of the mark? I don't believe the chicken business amounts to $300,000 in the whole State of Missouri, in any one year."

Well, my good friend, listen to the proof.

In the county of Macon there are, at present, five or six establishments devoted almost exclusively to the dealing in poultry and its products. The largest of these is owned by John J. Davis & Co., of this city, who estimate that they do half of the business, in their line, of the county. They have kindly allowed me to examine the figures of their cash-book, for each month, from November 1, 1893, to November 1, 1894. Their cash receipts for shipments of poultry, eggs and feathers during that period were $99,135.62. Multiply this sum by two and we have their estimate of the sum total of Macon county shipments, viz.: $198,271.24. Now, let us add to this a reasonable estimate for home consumption.

The population of Macon county is about 35,000, which comprises at least 7000 families. Allowing to each of these families but 35 cents per week for poultry and eggs, with two turkeys per year at 50 cents each, and the home consumption bill aggregates $134,400, which, added to the shipments, amounts to the grand total of $332,671.24.

Through Republican administrations and Democratic administrations, through flood and drought, through good report and ill report, in the picturesque park of the wealthy and around the cabin door of the poor, the busy hen is always to be depended upon for luxury and profit.

And now for a moment let us lift our minds above the consideration of appetite and profit and feast our souls upon the resplendent beauty of these benificent gifts of our heavenly Father, which we are permitted to improve, develop and adorn.

God pity the human being whose refinement is so stunted and undeveloped that he calls the smiling flowers "pretties for children."

God pity the human being who will not notice or cannot admire the transcendent sunsets painted anew almost every day with the brush of Divinity.

God pity the uncultured yeoman who, entirely absorbed in the pursuit of bread and butter, or money-making, is a stranger to the sentiment, "A thing of beauty is a joy forever."

The immortal words of our Saviour applied to the flowers of the field, "that Solomon in all his glory was not arrayed like one of these," are equally true of the beautiful, delicate shades and pencilings of our feathered pets

The types of fowls are as diversified as the conditions and habits of men, and may well represent them. The crowing, victorious chanticleer has for generations been the symbol of triumph and success. What better representave of quiet, portly dignity than the Brahma, Cochin or Langshan? What better representative of bustling, well-clothed modern activity than the Leghorn?

What better representative of the plain, well-to-do middle class, the mainstay of our country and its institutions, than the Plymouth Rock, Wyandotte or American turkey? What better representative of military pomp and circumstance than the crested Polish or Houdan? What better representative of military wealth, taste and magnificence than the Pea Fowl? In conclusion, ladies and gentlemen from abroad, who have honored yourselves by your encouragement of this enterprise, in behalf of the poultry-lovers of Macon, I cordially greet and welcome you.

We extend to you the freedom of our city and the latch-strings of our homes. The lovely foliage of our maple shade-trees has succumbed to the frosts and winds of winter; the drives upon our delightful boulevards have lost the charm of the mild September; but the inspiration of the

approaching holidays of the closing year should add zest to the hospitality of the fireside; and to this we invite you.

And may the third annual meeting and exhibition of the Missouri State Poultry Association be long memorable for its profit, its pleasure and its progress.

RESPONSE BY J. R. RIPPEY.

The response was made by J. R. Rippey, Secretary of the State Board of Agriculture, in the following words:

Mr. Chairman, Ladies and Gentlemen of the Institute:

It is indeed fortunate that in locating this convention your committee decided to meet with a people so generous and hospitable as the citizens of Macon. It has been my good fortune to know them since manhood, in fact they are my neighbors, and to know them is to admire their enterprise, respect their intelligence and good judgment and esteem and love them for their liberality and kindness.

Another reason why the location was wise and profitable is that Macon county leads all other counties in the State in the production of poultry and poultry products. For 1893 there were shipped from this county 1,537,464 pounds of poultry and 113 996 dozen eggs. This, remember, is the product shipped from the county, and does not include what was consumed in her cities and villages and on her farms

For the breeders and representatives of this industry to meet with this people, confer together, compare notes, observe conditions, learn to avoid mistakes, and mark the road to advancement, will be pleasant and cannot fail to result in good.

We have been invited to this county and are now welcomed to this city as the representatives of an industry that amounts to millions of dollars every year in this State; one whose volume has not heretofore been estimated, nor its value appreciated.

The shipments reported from the State during 1893 were 22,027,631 lbs. of poultry and 16,240,786 dozen eggs, representing a value of about $3,000,000

But it must be remembered that this statement does not include all the products shipped from this State. Several railroads reported to us only the car-load lots of commodities handled, leaving unaccounted for the bulk of the poultry and egg shipments over these lines, which was undoubtedly handled in lots less than car-loads. Making an estimate of the probable shipments that were made over lines reporting only in car-load lots, basing this estimate on the products of counties similarly located, and from which we have the total shipments, I have no doubt that we have supplied the people of the world outside of Missouri with the enormous amount of 30,000,000 lbs. of poultry and 25,000,000 dozen eggs. Then to this, if we add the amount consumed in our towns and cities, which would nearly equal the amount shipped from the State, and to this the amount consumed at the home of the farmer and producer, which would, probably, again double the amount accounted for, we may very readily see the immensity of the poultry industry and begin to appreciate its value.

A conservative estimate would, probably, place the total produce of the state at 90,000,000 pounds of poultry and 75,000,000 dozen eggs. Estimating the value of the poultry at 6 cents per pound and eggs at 10 cents per dozen, and taking no account of the vast number of broilers sold to our cities at fancy prices, we have a total valuation of $13,000,000 dollars per annum for the poultry products of this State.

This immense sum is the proceeds of a very small investment by each farmer in the State, and shows what may be accomplished in any one direction when all engage and each contributes his part, even though it be but a mite.

It may be well to suggest here that it is possible to increase this amount of poultry products without additional cost, by improving the breed of fowls. When we remember that Missouri has about 30,000,000 hens, and it is possible to double the present egg production by judicious mating, and thereby improve our fowls in that direction, resulting in the addition of millions of dollars to our income, we can very readily see the necessity for such action.

Again, a little extra feed when the hens cannot get out to gather it elsewhere, just a few dollars used in stopping openings in the chicken-house through which the wintry blasts drive the killing frost, and in fixing a few panes of glass through which the sunlight may enter, and a little kerosene with which to spray the roosts, nests and walls of the building and exterminate the

vermin, and occasionally the use of a cheap boy for an hour to thoroughly cleanse the house, will be found profitable investments, and will add materially to the revenue derived from poultry.

The census of 1890 shows that Missouri led all other States in the number of barnyard fowls. She should not only continue to lead in numbers, but the Missouri rooster should crow longer and louder, her hens prove more prolific and the industry more remunerative than elsewhere.

To consider the necessities of this industry, to promote its growth and increase its profits, we are here, the guests of an enterprising and liberal people. With sincere thanks we acknowledge their kindness, and in gratitude shall remember their hearty welcome.

The following topics formed the subjects for papers to be read and discussions upon the same at the Institute meetings of the Association.

The Scrubs Must Go.

By C. A. Emry, Carthage, Mo.

Mr. President, Members of Missouri State Poultry Association, and Friends:

To us has been assigned a scrubby subject. Through life we have kept our eye upon that word "scrub," and be that scrub a neglected person, beast or fowl, their scrubby selves have always left a tender cord vibrating close to our heart, and our wish for the bettering of their condition has made the subject of scrubs our life study. In the beginning all was perfect; so scrubs are but neglected, degenerated specimens. To us now, in this nineteenth century of scrubs, neglected, degenerated specimens (genuine scrubs) about rule the roost in the poultry kingdom. In these later days, men and women are found whose life-work is being devoted to the elevating of scrubs, and we see before us the lordly Brahma, Cochin, Langshan, Leghorn, Plymouth Rock and other breeds of beauty, each and every one having this legend written in letters of blood in their eyes, plainly to be seen and read by every true fancier, "The scrub must go." Yes, brother and sister fanciers, you have only to look in the eye of the breed you fancy to read that line, "The scrub must go," and then make this vow: my life work shall make you better and better until scrubs shall cease to rule the roost in the poultry world; your praise shall be sounded through vales and o'er mountains until the scrubs will be crowded all down upon the lower row ready to drop off into utter darkness." What a grand thought. The utter extermination of all scrubs, until every farm and city lot could boast of none but thoroughbreds. In this nineteenth century of scrubs, there is one word that scientific men have taken out of their dictionaries, the word "impossible," and only education and work is necessary to make that thought a reality and the hen-roosts of our children contain specimens of beauty to shower blessings upon us for our life-work against scrubs.

There are scrubs and scrubs, and then more scrubs, even in the best poultry yards, and this rule must govern the successful exterminator of scrubs. Quality, not quantity, only the best, and not much of that, is good enough for the genuine scrub exterminator.

The subject of scrubs widens out into a broad field, too broad for one short essay on scrubs to round up into ideas capable of being understood in this century of scrubs, but I want to speak of one class of scrubs and my idea of prevention. Even my honored friend upon the sand-hills of Kansas, Theo. Steinberg, has worried his gizzard because I sold him some Leghorn eggs that hatched Leghorn cockerels that left "impressions" upon his imported Buff progeny three months after he had sold the last pesky Leghorn cockerel from off his place. Now, on this subject Brother Steinberg is off. We have stood upon the sand-hills of Cochin fame and viewed the country round about, isolated in a measure, but plenty of houses within forty rods of his suburban home; but frisky Leghorns can take a morning walk long before our legal friend leaves his bed-chamber, and what is a four or six-foot fence to a Leghorn upon a morning lark. By this illustration we wish to impress upon breeders of Cochins and Brahmas that low fences keep in, but fail to keep intruders out, and many impressions have their origin in that fact, and scrubs are the natural result.

All have a right to their views upon all subjects, but high fences and careful attendants will prevent impressions and mixture of breeds in the poultry yards, and high fences are a step in the right direction when working for the extermination of scrubs.

As an illustration to show that fanciers are beginning to get in their work, I wish to state that during the egg trade season of 1893, we advertised B. P. Rock eggs from three yards of fine fowl at $3.00 per setting and from two yards good birds at $2.00 per setting during the entire year we only received one order for the $2.00 eggs, and that man lived outside the boundaries of civilization, being a resident of Arkansas (my home is within 35 miles of the line). This Arkansas man in the fall of 1892, while making his annual visit north to see his wife's people, happened to notice my poultry, and, being rather above his fellow-men at home, concluded to invest; but when I told him eggs from best yards were $3.00, it took his breath almost away, and the impression left upon him caused him to invest the next spring in $2.00 eggs; so there is hope, even for a man from Arkansas.

But Bro. fanciers, the scrub $1.00 per setting egg man and the $1.00 a head chicken man will have to go before all scrubs are exterminated. If all breeders would sell eggs at $3.00 to $5.00 per setting,

and give value received, the scrub question would soon be settled in the poultry world.

There is one positive fact as far as grand old Missouri is concerned: her State poultry shows do not wear the ear-marks of scrubs. Missouri is proud of her record as a poultry State. There is nothing that resembles the scrub in her standing. Her record is one we are all proud to honor. To the lady fanciers of Missouri much of this praise is due; as a class of true poultry fanciers and successful breeders of fine poultry and genuine scrub-exterminators, their work says to their brother fanciers: "Come up higher or we will have no room for you in the near future." We have great faith in their ability as scrub-exterminators, and now only time awaits us.

Grand old Missouri (poor old Missouri is to be a thing of the past) stands today with blessings upon her poultry banner for all true fanciers, and year by year scrubs must go. Fanciers must encourage the scrub to come up higher. Insist upon quality rather than quantity; give value received in all your dealings, and help to rejoice while the scrub slowly and surely vanishes from the poultry yards. In the future, as in the past, we shall consider it an honor to be classed as a genuine scrub-exterminator. The scrub must go.

DISCUSSION BY ALEX. MAITLAND, RICHMOND, MO.

The scrub must go, for economy's sake. Before taking up the scrub subject I wish to correct a little mistake made in the catalogue, as regards me being the President of the State Board of Agriculture, That honor belongs to my friend, Wallace Estill, of Howard county, Missouri, the gallant Missourian who carried her flag so far to the front in capturing nine of the ten premiums offered at the World's Fair on thoroughbred Angus cattle.

While this World's Fair is in my mind, let me call your attention to an article in the State Board's report for 1893, entitled "Missouri at the Fair," gotten up by the Executive Commissioner, J. K. Gwynn, and our worthy Secretary, J. R. Rippey, which contains a list of the exhibits and premiums of Missouri at the fair—a record unsurpassed, from an agricultural standpoint of view, by any State in the Union, or any country in the world, showing more logically than any arguments I can use the necessity that the "scrub must go." Just think of it: Missourians to beat the world, including Old Kentucky, on saddle-horses, jacks, mules, Berkshire hogs, Angus cattle, and even down Vermont on Merino sheep!

The first question every business man asks before engaging in any enterprise is, "Will it pay?" This subject seems to divide itself into two propositions:

First. That the breeding of scrubs has ceased to pay.

Second. That it will pay to breed a better class of stock.

In regard to the first proposition, if we take into consideration nothing else than the increased value of land and improvements in the last decade, compared with the time when your own and your neighbor's stock foraged over vast tracts of unenclosed lands, it seems unnecessary to consider anything else to show that a better class of stock must be grown on lands so increased in valuation, on very much the same principle as if the owner of a lot valued at $1000 per front foot were to erect a cabin on it, which he could not rent for over $5 per month, instead of a large office building, renting for thousands. Again, the growing of scrubs has ceased to pay, because if you wish to handle them, you can purchase them already grown on lands cheaper than yours. In the growing of poultry I am not very well posted, but if it will pay to grow better horses and cattle, why not poultry?

As regards the second proposition, it seems to be demonstrated at this exhibition that by using some of the breeds here represented, double the number of pounds may be produced, and others again giving a value in their beauty or some other characteristic beyond the common fowl.

New Breeds of Poultry.

By Theo. Hewes, Trenton, Mo.

The Buffs have been crossed on several other varieties, but their success has not been general. The Buff Leghorns are behind their sisters in many respects. With the Barred Plymouth Rocks, they are too close feathered. They are best as a dressed fowl when crossed on the Wyandotte. The Partridge Wyandottes are nothing more than a poorly-bred Golden Wyandotte.

Mating and Breeding.

By J. W. Wale, Harrisonville, Mo.

The successful mating, breeding and raising of thoroughbred poultry requires knowledge, patience and industry. It is not requisite that one should have a thorough knowledge of such industry to have reasonable success, but should use good reasoning power and observation. Study the business as other good men study theirs. In mating

thoroughbred fowls the most important point is constitution. Without this you will fail to raise good birds. Select birds from a good, reliable breeder, and from good uniform stock that has been bred in line for several generations. Do not select the highest scoring birds at all times, but select good, vigorous, typical-shaped specimens, as near to standard requirements as possible. Get the best male you can, and if the females are deficient in some minor points, be sure that the male is good in those points. The male should be active and rugged for the breed and possess strong masculine qualities. Select large females, as they give size to the progeny; avoid coarse, masculine-looking females, as they will not produce fine birds. Do not mate extreme colors in parti-colored varieties, as their progeny will be extreme in color. Get strong, vigorous, uniform stock, and by proper attention you will raise good birds.

Some writers say put eight to ten females of Asiatic breeders with one male, and ten to twelve of American and Mediterranean breeds with one male. Now such talk is sheer nonsense. It depends on the vigor of the male. One of my neighbors put between ninety and one hundred Leghorn hens and pullets with two males, and not more than 2 per cent of the eggs were infertile. I put twenty-three Langshan hens and pullets with one 3-year-old male, and there were not more than 2 to 3 per cent of the eggs infertile. I put thirteen Light Brahma hens and pullets with one cockerel, and nearly all the eggs were fertile. So you see it depends on vigor of males and the way they are kept.

Study the wants of your birds. A change of diet is often necessary. In the spring when their systems are changing, they need easily-digested, cooling food, just the same as you do. If you study your physical self, you will know what to feed and how often a change is necessary. Unless you keep your birds in a healthful condition the chicks will not be vigorous. If any of your birds are sick, or off their feed, try and find out what ails them. Use your mother-wit and don't depend on the reasoning power of others. Do not breed from immature stock; if you do you will have roup and other diseases. Old birds are better to breed from than young.

There can be no rule laid down to show the amateur how to successfully raise good birds, but never let them stop growing. Follow nature's methods as near as you can in everything, and above all, don't attempt to raise too many varieties. One breed is better than two, two are better than three, and three are better than more. How many well-known breeders made a reputation on more than one breed? A word to the wise is sufficient.

Marketing Poultry.

Address by P. M. Kieley, of St. Louis, to Missouri State Poultry Association.

This is a broad subject, and justice can hardly be done it in the short paper I propose submitting for your consideration. In the conclusions reached I am drawing on twenty-five years' experience in the market as a receiver and seller of poultry, both alive and dressed. The main points of interest to the producer, after his poultry is ready for market, is how and when to ship. As to where to ship, he must exercise his own discretion, and be governed by the advice he has from the best markets within his reach.

Beginning with spring, say the 1st of March, the markets of the country will be found rather bare of poultry, both alive and dressed, and will remain so until toward the 1st of May. The offerings during this time will be smaller than during any other time of the year, and the prices realized the best.

The good prices you may see quoted for spring chickens early in the spring will not interest you much, as the supplies then will be coming from Arkansas, Tennessee and further South; as in the shipping of fruits and vegetables they have their season in advance of yours, and when you are fairly started they have to withdraw. There is a wide territory to draw from, and competition springs from hundreds of shipping points in half a dozen States, and as a result the elements of risk are inseparable from every shipment, no matter where going to.

Poultry shippers will observe, however, that the severe and sudden fluctuations in prices that years ago marked the course of the markets at certain times, especially during the winter, no longer exist. The market is steadier, and fancy prices can no longer be secured at any stage of the season or year. The more uniform prices prevailing everywhere now are due to various causes. Cold storage is an important factor in this connection, for many such establishments in the principal cities have supplies ready to throw on the market when prices advance. Independent of cold-storage stock, considerable could at any time be drawn from various shipping points, so that twelve hours often materially alters the situation.

One feature of the business that all markets are steadily drifting to is more uniform methods in the matter of dressing and preparing for the market. This is a sensible move, and will serve to get out of

the poultry business all it is capable of yielding. For instance, this market, up to a year ago, took only scalded and drawn poultry with heads and legs off during the dressing season. This style of dressing was not acceptable to leading markets elsewhere, and we were deprived of these markets as outlets when a surplus arose. Now our markets take all kinds of dressing, with a preference for scalded as against dry picked, and drawn poultry should not come here or elsewhere unless the weather was very cold; for the drawn stock soon sours, especially in soft or unfavorable weather.

The common practice of holding back for the holidays, or special occasions, is always attended with risk. Not infrequently too many do so and then break the market, so there is no rule to follow as to the best time to ship, and none can be devised, and you should not be led astray by the liberal promises so often made by dealers or merchants to whom you are consigning your goods. As to advices of this character, would suggest that you select an experienced and reliable merchant in each market you have access to, and be governed by their reports in determining where to ship to. The man who wants to buy in preference to selling them for you on commission wants a larger margin than the regular commissions afford.

As all kinds of poultry, both dressed and alive, are now sold by the pound, I cannot urge too strongly the improvement of the stock you are seeking a market for, and fatten them sufficiently to be presentable to the best trade. Nice handling—great care in dressing, so the fowls will appear white, plump, clean and attractive, is very important. Too much rough, poor and badly handled stock comes to every market, and such shipments are largely responsible for the low prices ruling.

With the steady growth of fields for supply, not only of this, but of all other food products, the prices have steadily declined and small profits have resulted for all.

The decline in prices, however, has hardly kept pace with the shrinkage of values of most other products, and poultry raising still stands as one of the best paying products of the farm; and as we handle all farm products, we are in a position to advise you intelligently.

Dressed Poultry Exhibition.

This exhibition was the first ever attempted in the West. Many thought the fowls were to be brought to Macon alive and dressed while here. These entries, of course, did not materialize. The exhibit was of a high class, and now that it is understood, many have expressed a desire to compete next year. Quality and not size governed in making the awards, except in the Capon class.

Col. Harvey Batts, Geo. L. Belcher and Mrs. J. A. Maxwell awarded the prizes, and did the work to the entire satisfaction of the exhibitors. Awards were as follows:

Asiatics—1st, Buff Cochin, Howe Bros.; 2d, same. American and Games—1st, B. P. Rock, Howe Bros.; 2d, Indian Game, same. Cross breeds—2d, J. A. Ayres, Buff Cochin and Indian Game. Turkeys—2d, M. Bronze, Mrs. G. A. Brown. Capons—1st, Buff Cochin, Howe Bros.; 2d, B. P. Rock, same. Geese—1st, Howe Bros.; 2d, same. Ducks—1st, Howe Bros.; 2d, same on Pekins. Heaviest dressed chicken, any age or variety, Buff Cochin, Howe Bros.; heaviest dozen eggs, Mrs. T. W. Ragsdale, Light Brahmas; best dozen eggs, Redmond Whitehead, White Wyandottes.

Dec. 12, 7:30 p. m., 1894.

Institute called to order by A. J. Blake, chairman of the executive committee. Letters were read from Gov. W. J. Stone, Dr. Porter, Dean of the Agricultural College, and G. W. Fry. The first paper of the evening was:

The Cornish Indian Games.

By Mrs. Bettie Bates, Hale, Mo.

Having been among the first in the State of Missouri to engage in the breeding of this noble fowl and been quite successful, I have no regrets to express or failures to explain. I have always endeavored to avoid too much enthusiasm in speaking of a bird I admire so much, but now hesitate to speak of them as I know them. They are very hardy and vigorous; grow rapidly, and despite the antagonism which exists between great laying and great table qualities, the Indian has proven very successful. The eggs are large for so good a table fowl, usually a pale buff in color, though sometimes darker. However,

strains differ somewhat in both the size and the color of eggs; but they are especially excellent for boiling or fine cooking, and the flesh solid, of fine flavor and grain, and not dry. They attain a good weight, and for table qualities I really believe cannot be excelled. Very few fowls indeed, if any, dress as handsomely as the Indian Game, even when quite young, hence it is ready for killing at any stage of its growth; I have killed pure-bred birds, and their crosses on other breeds, for my own table, and know that the reputation of the fowl is warranted by experience; whilst for crossing they are superb, giving weight, strength, solidity and hardiness, the most desirable points in the make-up of a table fowl.

I prefer the pure-bred fowl every time, but the cross-bred is quite an improvement on some other breeds as table fowls.

I have no experience as to their adaptability to the farm, but from general observation of things they would be well adapted to it, being very active, good foragers and like to hustle for a living, and if allowed their liberty would need but little feeding in summer, as they naturally love animal or insect food more than any other breed. They are not large eaters, but are always ready. They are neither lazy nor indolent, but energetic and industrious, yet bear confinement well, and easily kept in a small place and seem not to require an extensive range; are gentle, docile and faithful mothers and good setters, especially the lighter hens. I do not like the very heavy hens for setters because apt to crush their eggs, especially if one happens to get lame with thin shells under her.

Hens of this breed that weigh 5½ to 6 pounds make thoroughly reliable incubators; are great feeders of their young; the eggs hatch well and an Indian Game chick hatched means a fair chance for an Indian Game fowl twelve months hence. I have tested the breed beside other fowls denominated hardy, and have yet to discover that it has a superior in this very necessary quality.

All varieties have their enthusiastic advocates, and, of course, my hobby is the Indian Game; but regardless of that fact, I have given their true character as seen in everyday life, as I have found them, and I have none so well adapted to general purposes as they are. They have, moreover, attained a popularity since their introduction into this country, which was but a few years ago, that no other within my knowledge has within so short a time.

Some imagine, from its name, that it is a very pugnacious fowl, and in the imagination there oft arises the thought of scalped chickens, the combination of names, Indian and Game, being suggestive; but they were first imported from India, already bred to standard re-

quirements, hence derived the compound name Indian and Game on account of the gamey flavor of the meat. Not everything called Indian Game is worthy of the name, for there are frauds in every business, and the poultry is no exception, for I regret to say some will sell you a mongrel at a low price for Indian Game, Langshan, Wyandotte, or whatever the case may be, and sometimes the unfortunate victim gets disgusted and denounces all thoroughbred fowls, and again returns to the mongrel.

Those who would thoroughly appreciate the beauty, profit and pleasure of the thoroughbred fowl should be sure to get the best that money can buy or skill produce, but most assuredly get the breed you wish and that suits your fancy and your locality, then will success crown your efforts. My dear hearers, this is my first essay at a public address. I have not kept very close to my subject, but as experience enlarges and I have the opportunity, I hope to meet you again on a similar platform.

DISCUSSION BY ADAM THOMPSON.

This variety crossed on Plymouth Rocks nearly doubles the amount of breast meat. The pullets are then metallic black, with very heavy thighs. The capons of this cross, when matured, will weigh from 13 to 14 pounds. They cross well on many other varieties.

Mongrels or Pure Breeds?

By Mrs. E. A. Creel. Carrollton, Mo.

About twelve years ago fate had led me to join my fortunes with those of a farmer lad in grand old Missouri. Residing the greater part of my life in the city, everything was new, strange and delightful on the farm. Having always had a love for dumb animals, and especially the feathered pets, it is not strange that I soon became interested in my husband's first purchase, consisting of a dozen so-called Plymouth Rocks, a few mixed fowls, and a gift from a dear old friend of fifteen pure Brown Leghorns.

My first summer's work gave me seventy-five young chicks with which to start in the winter, besides my original stock. My interest was now fully aroused, and I determined that next spring my flock should beenlarged to twice the number or more, and visions of wealth untold floated before my eyes.

These air castles were destined to be rudely dispelled, for when in the following spring I attempted to market some of my "frys," the best

price I could get was one dollar and a half a dozen. Thinking, perhaps, one could do better with dressed poultry, we tried our hand at that; and not being as familiar with the habits of fowls then as now, selected the fall as the time for the first experiment. I shall not soon forget how we picked and picked, and worked to remove those pinfeathers with which "biddy" was trying to replenish her winter wardrobe and provide against the winter blasts of old Boreas.

Our dressed poultry enterprise not proving a rousing success, we turned our attention to eggs, and took the first step in that direction by saving all the early pullets and getting them to begin laying before cold weather. This venture was more successful than the others, and many an item in the grocer's bill was canceled by those same eggs. It is no doubt true that there is no stock on the farm that pays a better profit on the capital invested than poultry. Not only do they supply the family with eggs for breakfast, dinner and supper, fried, baked and stewed chicken the year round, to say nothing of turkey for Thanksgiving, Christmas, and other festive occasions, but they add many an extra dollar to the good wife's pocket-book and enable her to purchase little gifts and luxuries that would otherwise be out of her reach.

If it pays the farmer to get the best hog to improve his stock, or the dairyman the best cow to increase the milk and butter supply, why will it not pay him to get the best thoroughbred poultry to increase the receipts in that line. The superiority of the pure breeds over the common fowls has been demonstrated to my satisfaction by the good results obtained from my own Leghorns, hence I soon disposed of all my mixed flock and invested largely and only in the pure breeds.

When we note the signs of the times, we see that the interest is aroused among all classes of people in all parts of the country on the culture of the pure-bred fowls. When large establishments like the Armours' keep a standing advertisement urging the farmer to breed up, obtain higher prices for better stock; when we note the number of new poultry clubs organized over the country and even the increased interest at our county fairs, where they are employing experts to judge the fowls, then we think the Prince of Progress has touched the hand of slumbering Ambition and aroused our people to new effort, fresh energy, an and earnest and an exalted aspiration to breed and to have only the best in poultry culture.

Judge Hewes was then called out to give the Association some items in reference to a trip he had made the Puget sound poultry people of the Northwest. His information related largely to the fact that many of the breeders train their show birds by careful handling. He would recommend a little more of that work with our own exhibitors.

Believes we have as good stock as any people in the world, but we do not prepare it for exhibition as carefully as we might. Many try to breed too many varieties.

The Institute meeting then adjourned. It was the first effort of the kind in connection with the annual exhibition, and proved one of great interest. Many expressed a desire to have the same features adopted at future exhibitions.

December 13, 7:30 p. m.

The Association convened in a business session at the Palace hotel. Called to order by President M. L. Andrews. Minutes of the last meeting read and approved. The President then delivered his annual address, as follows:

To the Officers and Members of the Missouri State Poultry Association:

It is with pleasure that I greet you on the occasion of our third annual session, and the best that I can wish for the future of our Association is that the interest in each session, and the ratio of improvement in both members and quality of stock at our previous shows, may be continued.

On May 20th, 1892, when a little band of breeders met at Sedalia and organized the Missouri State Poultry Association, little did they anticipate that in so short a time their efforts would materialize into such a success as our present session, and that our Association would be looked to with pride by a majority of the foremost and best breeders of the State, and referred to by the poultry press as one of the most successful associations in the country.

When our first annual show was announced, and not a dollar in sight for a premium for the successful exhibitors, and with quite an expense to overcome, many doubted the outcome of our undertaking; but when our session was over and pronounced a success, both socially and in the quality and number of birds shown, and the Association free from debt, the feeling was changed, and every exhibitor seemed proud of the record they had made at the Missouri State show, and went home determined to make a better exhibit the following year.

That they carried out their determination was shown by the interest taken in the second annual session held at Warrensburg, where our exhibit went on record as one of the largest and best shows ever held in the West, and exceeded the expectations of everyone. Competition was so close in many classes that, as a prominent breeder from an adjoining state said: "You were in luck to get your birds inside the hall, much less a premium."

That the breeders of Missouri are fanciers as well, is evidenced by the fact that they did not exhibit at our past two sessions, with the expectation of being paid, for they knew the Association did not have a dollar to put into premiums, and I doubt if there is one who regrets having attended either meeting. Such loyalty on the part of members and exhibitors is what has made our Association what it is today, and is to be commended. The officers have worked diligently for the upbuilding of the Association, but their efforts would have been fruitless but for the co-operation of the members, who have worked hard first, last and all the time, with no factions and with but one object in view: The pushing to the front of the poultry interests of the grandest State in the Union.

The successes of the past two sessions caused much rivalry on the part of competing towns for this meeting, with the result that we have some cash to offer as premiums. It is true, the amount is not large, and I dare say we would have had another successful meeting, if we could not have promised a dollar, but we hope to continue to improve and finally attract the attention of our State officials to such an extent that they will make a yearly appropriation to help build up and improve the poultry industry, which is becoming one of the most important in the State, and as we now stand at the head of the states in the value of our poultry products, we are in a position to press our rights. Before closing, I wish to recommend:

First.—That our Association continue the policy of the past, by offering only such money for premiums as they have on hand, after allowing for all expenses, as that leaves it in shape for a successful future.

Second—Continue to have entries free, for it takes birds to make a show, and the shows with the largest number of birds go on record as the most successful, and the time is past when exhibitors will crowd a hall with inferior birds.

Third—That for our future shows, birds be cooped singly and in pens so that they can be properly classified, which will facilitate judging, prevent birds being overlooked, lessen the number of attendants and the work of our secretary and superintendent, and present a much more attractive appearance.

Fourth—That as an association, we draft resolution setting forth the discrimination shown by express companies against the advancement of the poultry industry and the shipping of thoroughbred fowls, by reason of exorbitant charges, and asking their investigation and consideration of our claims; and that a copy of same be sent to each of the different companies.

In conclusion: We owe a debt of gratitude to the poultry press of the country for their able efforts in our behalf, and more especially to "Poultry Topics," "Midland Poultry Journal" and "Colman's Rural World" for their untiring zeal and columns of valuable space devoted to our interests, and they deserve the hearty support of every breeder and fancier in the State.

The breeders and fanciers of Macon and vicinity, who with push and energy secured our session, and who have devoted both time and money to make it superior to our previous efforts, are to be congratulated for the spirit shown, and certainly deserve a vote of thanks, as does also the State Board of Agriculture for aid furnished to make our meeting instructive and a success socially.

As Missouri is now acknowledged at the head of the states in the importance of her poultry products, and our Association the equal of any, I trust that every breeder and fancier in the State will put a shoulder to the wheel and *push* to maintain our enviable position, and that the officers of our Association will, in the future as in the past, have the undivided support of every member.

Thanking you all kindly for the honors bestowed, and the assistance you have accorded me during my term of office, I remain,

Very respectfully, M. L. ANDREWS, President.

The committee on resolutions then made the following report, which, after several amendments, was adopted. The most important was the adoption of an entrance fee of 15 cents for each bird shown, and a charge of $1 for each exhibitor, this latter sum to admit the exhibitor to the show-room during the week of the exhibition:

To the Officers and Members of the Missouri State Poultry Association:

Your committee on resolutions beg leave to submit the following for your consideration:

1. *Resolved*, That it is the sense of this committee that there should be an entrance fee charged for each and every specimen exhibited.

2. *Resolved*, That this Association ask and urge the Legislature of our State for a specific appropriation of $2000, for the benefit of this Association in its work and efforts to advance the interests of thoroughbred poultry in this State.

3. *Resolved*, That the thanks of this Association be tendered to the various express companies for their kind consideration in giving the exhibitors of this meeting the liberal terms of one rate for the round trip

4. *Resolved*, further, That we consider double first-class rates unreasonably high for th transportation of fancy fowls.

5 *Resolved*, That the thanks of this Association be tendered the State Board of Agriculture for their presence, assistance and manifest interest in the welfare of the Missouri State Poultry Association, and also for the liberal cash premiums given the dressed poultry exhibit.

6. *Resolved*, That the earnest and sincere thanks of the Association are due to the officers for their diligent and untiring efforts and labor for the success of the exhibit just closing.

7. *Be it further resolved*, That our thanks be and the same are hereby tendered the people of Macon City and county for their kind, considerate and liberal treatment of this Association during our exhibits.

MRS. EMMA G. FOSTER,
GEO. L. BELCHER,
W. C. GRADY,
Committee.

It was also ordered that all exhibition coops must be made to open in front, and be distinctly marked with owner's name, and not contain more than one variety of birds.

The following officers were then selected for the ensuing year:

M. L. ANDREWS, President,
GEO. L. BELCHER, Vice-President.
MRS. E. A. CREEL, Treasurer.
ROLLA G. CARROLL, Secretary.
A. J. BLAKE, Chairman Executive Committee.
HENRY STEINMESH, Member Executive Committee.
MRS E.Y. FOSTER, Member Executive Committee.

On motion, date of next Annual Exhibition was fixed for second week in December.

On motion, adjourned.

Scores of the Winning Birds.

(All are of Missouri unless otherwise designated.)

B. P. ROCKS.—Cock—1st, 90½, T. Cadwallader, Deepwater, Mo.; 2nd, 90, C. E. Harrison, Mexico. Hen—1st, 92, C. E. Harrison; 2nd, 92, J. R. Lampson, Mexico; 3rd, 91¾, C. E. Harrison. Cockerel—1st, 93, W. T. Doyle, Maryville; 2nd, 92¾, J. R. Lampson; 3rd, 92½, Mrs. P. R. Smith, Macon. Pullet—1st, 92¾, Geo. H. Kunkel, Mexico; 2nd, 92½, J. R. Lampson; 3rd, 92¼, Rolla G. Carroll, Warrensburg. Pen—1st, 184¾, J. R. Lampson; 2nd, 183⅝, Rolla G. Carroll, Warrensburg; 3rd, 183½, W. T. Doyle.

WHITE P. ROCKS.—Cock—1st, 94, E. M. Durham, La Plata; 2nd, 92, J. A. Ayers, La Plata; 3rd, 90½, Mrs. D. B. Swift, Shelbina. Hen—1st, 95½, J. A. Ayers; 2nd, 94½, J. A. Ayers; 3rd, 93, J. A. Ayers. Cockerel—1st, 94½, J. A. Ayers; 2nd, 93½, W. E. Ryan, La Plata; 3rd, 93½, W. E. Ryan. Pullet—1st, 96, E. M. Durham; 2nd, 95½, J. A. Ayers; 3rd, 95½, Mrs. L. E. Shafer, Knob Noster. Pen—1st, 189½, J. A. Ayers; 2nd, 189⅜, E. M. Durham; 3rd, 187 11-16, W. E. Ryan.

SILVER WYANDOTTES.—Cock—1st, 91½, A. & E. Tarbox, Yorkville, Ill.; 2d, 91, A. & E. Tarbox, Yorkville, Ill.; 3d, 91, E. R. Ballard, Sedalia. Hen—1st, 92, A. & E. Tarbox; 2d, 92, A. & E. Tarbox; 3d, 92, M. L. Andrews, Sedalia. Cockerel—1st, 93½, Mrs. E. A. Creel, Carrollton; 2d, 93½, Mrs. D. M. May, Emporia, Kas.; 3d, 92½, A. & E. Tarbox. Pullet—1st, 94, A. & E. Tarbox; 2d, 93½, Mrs. D. M. May; 3d, 93½, A. & E. Tarbox. Pen—1st, 186½, Mrs. D. M. May; 2d, 186, Mrs. E. A. Creel; 3d, 185⅞, A. & E. Tarbox.

GOLDEN WYANDOTTES.—Cock—2d, 89, Jno. N. Wiles, Woodville. Hen—2d, 88, same. Pullet—1st, 91½, C. A. Wardell, Macon, Mo.; 2d, 91½, same; 3d, 90½, same.

WHITE WYANDOTTES.—Cock—1st, 93, Mrs. P. R. Smith, Macon; 2d, 92, Redmon Whitehead, Macon; 3d, 90, C. W. Nuss, Coloma. Hen—1st, 96, M. L. Andrews; 2d, 95½, same; 3d, 94½, Redmon Whitehead, Macon. Cockerel—1st, 93, C. W. Nuss; 2d, 93, same; 3d, 93, M. L. Andrews. Pullet—1st, 96, C. W. Nuss; 2d, 95½, same; 3d, 95½, M. L. Andrews. Pen—1st, 188½, M. L. Andrews; 2d, 187⅛, C. W. Nuss; 3d, 185¼, Mrs. F. A. Gantz, Stewartsville.

LIGHT BRAHMAS.—Cock—1st, 94½, B. F. Wood, Warrensburg; 2d, 94, Mrs. Ella Thomas, Quarles; 3d, 91½, R. R. Clendenen & Bro., Raymore. Hen—1st, 94½, same; 2d, 94, Mrs. Ella Thomas; 3d, 94, Clendenen & Bro. Cockerel—1st, 95, B. F. Wood; 2d, 95, Mrs. Ella Thomas; 3d, 95, Clendenen & Bro. Pullet—1st, 95½, B. F. Wood; 2d, 95, Clendenen & Bro.; 3d, 95, T. Cadwallader, Deepwater. Pen—1st 190, B. F. Wood; 2d, 189⅝, Clendenen & Bro.; 3d, 188⅜, B. F. Wood.

DARK BRAHMAS.—Cock—1st, 90, J. C. Goodding, La Plata, Mo.; 3d, 87½, same. Hen—2d, 89, same; 3d 89, same. Pen—2d, 178½, same.

BUFF COCHINS.—Cock—2d, 89½, J. F. Jones; 3d, 88, Howe Bros., Meadville. Hen—1st, 93½, Mrs. Kate E. Case, Knob Noster; 2d, 90, Howe Bros., Meadville; 3d, 90, Volkman Bros., Wellston. Cockerel—1st, 94, Mrs. Kate E. Case; 2d, 93½, Mrs. Emma Y. Foster, Borland, Mo. Pullet—1st, 95¼, Mrs. Kate E. Case; 2d, 95½, same, 3d, 95¼, same. Pen—1st, 189 7:16, same; 2d, 188⅝, same, 3d, 188¼, same.

WHITE COCHINS.—Cock—3d, 87, Mrs. D. B. Swift, Shelbina. Hen—1st, 94½, S. A. McClellan, Granger. Cockerel—1st, 94, Mrs. Emma Y. Foster; 2d, 90, F. P. Robinson. Pullet—1st, 94, Mrs. Emma Y. Foster; 2d, 92½, F. P. Robinson; 3d, 92½, Mrs. Emma Y. Foster.

PARTRIDGE COCHINS.—Cock—1st, 93, J. C. Goodding; 2d, 92, C. W. Nuss; 3d, 86½, Jno. N. Wiles. Hen—1st, 93, Howe Bros.; 2d, 92½, A. F. Zimmerman, La Belle; 3d, 92½, J. C. Goodding. Cockerel—1st, 94, Howe Bros; 2d, 93½, C. W. Nuss; 3d, 93, same. Pullet—1st, 93½, Howe Bros.; 2d, 92 1-2, C. W. Nuss; 3d, 92 1-2, Mrs. G. F. Fleming, Rosendale. Pen—1st, 186½, Howe Bros.; 2d, 184¾, C. W. Nuss; 3d, 184⅝, J. C. Goodding.

BLACK LANGSHANS.—Hen—1st, 94, W. H. Ritchey, Sedalia; 2d, 93 1-3, J. A. Ayers. Cockerel—1st, 94 1-2, W. H. Ritchey, Sedalia; 2d, 93, J. A. Ayers; 3d, 92 1-2, Osage poultry farm, Warsaw. Pullet—1st, 94 1-2, same; 2d, 94 1-2, same; 3d, 94 1-2, Volkman Bros. Pen—1st, 187⅜, W. H. Ritchey; 2d, 185¼, Volkman Bros.

S. C. B. LEGHORNS.—Cock—1st, 91 1-2, Lee W. James, Leeton Mo.; 2d, 89 1-2, Mrs. B. G. Mackey, Clarksville. Hen—1st, 92 1-2, same;

2d, 92 1-2, Goodding Bros.; 3d, 92 1-2, Wright Robinson, Macon. Cockerel—1st, 95, Jas. Quorollo, Kearney; 2d, 95, Goodding Bros; 3d, 95, Jas. Quorollo. Pullet—1st, 95 1-2, same; 2d, 95, same; 3d, 95, same. Pen—1st, 190⅛, same; 2d, 188⅛, Mrs. B. G. Mackey; 3d, 188, Goodding Bros.

R. C. B. LEGHORNS.—Cock—1st, 94 1-2, Mason's poultry farm, Grant, Mich. Hen—1st, 93 1-2, same. Cockerel—1st, 93, same. Pullet—1st, 95 1-2, same; 2d, 95, same; 3d, 94 1-2, same. Pen—1st, 189⅜, same.

S. C. W. LEGHORNS.—Cockerel—1st, 95, Mrs. Emma Y. Foster; 2d, 94½, Mason's Poultry Farm; 3d, 94½, J. C. Black, Maryville. Pullet—1st, 96, J. C. Black; 2d, 951-2, Mason's poultry farm; 3d, 95½, J. C. Black, Maryville. Pen—1st, 189⅞, same 2d, 189½, Mrs. Emma Y. Foster.

R. C. W. LEGHORNS.—Cockerel—1st, 95, S. A. McClellan, Granger, Mo.; 2d, 94, same; 3d, 93, Mason's poultry farm. Pullet—1st, 95½, S. A. McClellan; 2d, 95½, same; 3d, 95, same. Pen—1st, 190⅛, same; 2d, 187⅝, same.

BRONZE TURKEYS.—Adult, Tom—1st, 98, Geo. L. Belcher, Carrollton; 2d, 98, C. W. Nuss; 3d, 96, Mrs. B. G. Mackey. Yearling, Tom—1st, 98, Geo. L. Belcher; 2d, 97½, Mrs. B. G. Mackey; 3d, 94, Mrs. E. A. Creel. Hen—1st, 98, Mrs. T. W. Ragsdale, Paris; 2d, 97½, S. A. McClellan; 3d, 97½, Mrs. Emma Y. Foster. Cockerel—1st, 97, Mrs. B. G. Mackey; 2d, 97, Geo. L. Belcher; 3d, 96½, Mrs. Ella Thomas. Pullet—1st, 98½, Geo. L. Belcher; 2d, 98½, same; 3d, 98, Mrs. H. E. Jones, Quarles. Pen—1st, 194, Mrs. Emma Y. Foster; 2d, 193⅞, Mrs. B. G. Mackey; 3d, 193⅝, Mrs. T. W. Ragsdale. Three females and one male—1st, 195, Geo. L. Belcher; 2d, 194⅛, Mrs. B. G. Mackey; 3d, 194⅛, Mrs. Emma Y. Foster.

INDIAN GAMES.—Cock—1st, 93, Volkman Bros.; 2d, 87, Mrs. P. R. Smith, Macon. Hen—1st, 92 1-2, Adam Thompson, Amity; 2d, 91, Mrs. Bettie Batts, Hale; 3d, 91, Adam Thompson. Cockerel—1st, 93 1-2, same; 2d, 93 1-2, Volkman Bros.; 3d, 93, Mrs. Bettie Batts. Pullet—1st, 92 1-2, same; 2d, 92 1-2, Volkman Bros.; 3d, 92, Adam Thompson. Pen—1st, 185⅛, same; 2d, 184¾, Volkman Bros.; 3d, 184⅝, Mrs. Bettie Batts.

B. B. RED GAMES.—Cock—1st, 94, Chas. E. Storr, Mexico; 2d, 93 1-2, Volkman Bros. Hen—1st, 94, Chas. E. Storr; 2d, 93, Volkman Bros.; 3d, 93, same. Cockerel—1st, 94 1-2, Chas. E. Storr; 2d, 93, same; 3d, 93, same. Pullet—1st, 94, Chas. E. Storr; 2d, 93, same; 3d, 93, Volkman Bros. Pen—1st, 188, Chas. E. Storr; 2d, 186 ¾, same; 3d, 186 1-2, Volkman Bros.

BLACK SUMATRA GAMES.—Cock—1st, 92, Volkman Bros. Hen—1st, 94 1-2, same; 2d, 94, same. Cockerel—1st, 95, same; 2d, 93 1-2, Wright Robinson, Macon; 3d, 92 1-2, J. M. Hamisfar, Warrensburg. Pen—st, 189½, Volkman Bros.; 2d, 186½, J. M. Hamisfar.

S. S. HAMBURGS.—Cock—2d, 89, W. E. Webb, Macon; 3d, 86 1-2, J. B. Cunningham, Macon. Hen—1st, 93 1-2, W. E. Webb; 2d, 93, Howe Bros.; 3d, 93, W. E. Webb. Cockerel—1st, 92 1-2, S. A. McClellan; 2d, 93, same; 3d, 93, same. Pen—1st, 185 1-2, same; 2d, 181½, Mrs. P. R. Smith; 3d, 178, Howe Bros.

WHITE CRESTED BLACK POLISH.—Cock—1st, 91, J. A. Ayers. Hen—1st, 94 1-2, same; 2d, 93, Volkman Bros. Cockerel—1st, 92, same. Pullet—1st, 94 1-2, same; 2d, 93, J. A. Ayers; 3d, 93, Volkman Bros. Pen—1st, 184 7-8, same.

HOUDANS.—Cock—1st, 92, Mason's poultry farm. Hen—1st, 94, same; 2d, 92 1-2, same. Cockerel—1st, 91 1-2, S. A. McClellan; 2d, 91, same; 3d, 87, T. A. Craig, Macon. Pullet—1st, 93, S. A. McClellan; 2d, 92 1-2, Mason's poultry farm; 3d, 92, S. A. McClellan. Pen—1st, 184 1-2, Mason's poultry farm.

BLACK MINORCAS.—Pullet—1st, 94, Lee W. James, Leeton; 2d, 93 1-2, same.

AMERICAN DOMINIQUES.—Cockerel—3d, 86 1-2, Wm. P. Beach, Macon. Pullet—3d, 86 1-2, same.

WHITE DORKINGS.—Cock—1st, 92, Mrs. D. B. Swift, Shelbina, Hen—1st, 93 1-2, same; 2d, 93, same. Pullet—1st, 95 1-2, same; 2d, 93 1-2, same. Pen—1st, 185½, same.

WHITE INDIAN GAMES.—Cockerel—1st, Richard Schmidt, Hannibal. Pullet—1st, same.

W. F. B. SPANISH.—Pullet—1st, 93 1-2, T. Cadwallader.

PIT GAMES.—1st, pair, Watson Bland, Bevier; 2d, same.

WHITE GUINEAS.—1st, pair, M. L. Andrews.

PEKIN DUCKS.—1st, pair, Mrs. J. G. Webster, Bolckow; 2d, same.

TOULOUSE GEESE.—1st, pair, Mrs. J. G. Webster.

GOLDEN PHEASANTS.—1st, pair, M. L. Andrews.

WHITE HOLLAND TURKEYS.—Tom—1st, 96, F. P. Robinson. Pullet—1st, 92, same.

B. B. RED GAME BANTAMS.—Cock—1st, 92½, R. K. Tisue, Moberly, Mo. Hen—1st, 93, same. Cockerel—1st, 93 1-2, same. Pullet—1st, 94 1-2, same; 2d, 93 1-2, Chas. E. Storr; 3rd, 93, same. Pen—1st, 186½, R. K. Tisue.

GOLDEN SEABRIGHT BANTAMS.—Cock—2d, 86 1-2, R. K. Tisue. Hen—1st, 90, same. Cockerel—1st, 90 1-2, same. Pullet—1st, 92, same; 2d, 89, same; 3d, 89, same. Pen—1st, 180 1-2, same.

GOLDEN DUCKWING BANTAMS.—Cock—1st, 92, R. K. Tisue. Hen—1st, 91 1-2, same. Cockerel—1st, 91 1-2, same. Pullet—1st, 93, same.

WHITE COCHIN BANTAMS.—Cockerel—1st, 92, B. F. Clark, Stewartsville. Pullet—1st, 95, same; 2d, 92 1-2, same.

BUFF COCHIN BANTAMS.—Pullet—1st, 93 1-2, Miss Ora Clark, Stewartsville; 2d, 93 1-2, same.

NOTES.

The Partridge Cochins, White Plymouth Rocks and Indian Games were placed in class II in the catalogue, but a provision was inserted that they, with other varieties, would be paid the premiums in class I, if shown in numbers equal to the lowest numbers entered in class I. These three varieties did that, and consequently were paid the same premiums as those originally in class I.

Mrs. Kate E. Case won a great victory in the Buff Cochin class and well deserves the title of Queen of the Buffs. She won first, second and third on breeding pen, and the females in the third breeding pen scored 64½ each, with cockrel at 93 1-2.

J. R. Lampson won the $15 cash prize offered last year by J. E. Rundell, and won in 1893 by A. D. Hawke.

Chas. E. Storr won first on cock, first, second and third on pullet, and first and second on pen. All on his B. B. Red Games.

S. A. McClellan won nine firsts, seven second and three third prizes, and the "Rural World" medal on Hamburgs. This was his first exhibit.

The judges decided all ties as they went along. Many prizes were won by only a difference of one-sixth or an eighth.

The S. C. B. Leghorn first, second and third prize hens all scored the same, 92 1-2, and the winning cockerels all were 95.

Mrs. D. B. Swift had no competition on White Dorkings; they were a fine pen and scored from 92 to 95 1-2.

The Buff Leghorns were only out as a single pen, scoring 88 to 90 1-2. E. M. Durham won the Topics medal for the 10 highest scoring fowls in the American class. B. F. Wood did the same for the Asiatics.

President M. L. Andrews showed a pair of Golden pheasants that were much admired; also an Amherst pheasant.

Mrs. J. G. Webster and Mrs. G. A. Brown were the only contestants on the Pekin ducks. Both had excellent specimens; the first and second honors went to Mrs. Webster.

A pair of Toulouse geese won first for the same lady.

R. K. Tisue of Moberly won four firsts, two seconds and a third on his Golden Seabright Bantams, and still better on his B. B. R. Game Bantams.

President Andrews and your correspondent remained in Macon until the last premium was paid and the last check drawn. It was a mountain of labor that no one can fully realize without passing through the experience. They have the satisfaction and can congratulate themselves and the Association that every dollar contracted was paid before the week closed. Some of the checks were small, but they were as cheerfully drawn as though they had been larger.

Much of the success of the exhibition was owing to the excellent work of Superintendent A. E. Alden, of Maryville, who was the first man on the ground and remained until every bird was on the cars. He was ably assisted by Colonel E. R. Ballard (6 feet 4 1-2 inches), Major T. Cadwallader and Captain Louis Volkman. They all deserve thanks and praise for the uniformly good work done.

Many others gave ready aid whenever called upon. Only two cranks put in an appearance during the week, and the gallantry of the male members and the generosity of the ladies allowed them to have their own sweet way. Not a cross or rough word was heard from first to last. In fact, everyone came to have a good time and had it.

Farewell to the Poultry Exhibition of the Missouri State Association for 1894. ROVER.

MACON, MO., December 17, 1894.

Poultry on the Farm.

While this is an age of specialties, I do not think the farmers here in the West are yet ready, if they ever will be, to take up any branch of agriculture to the exclusion of all others. I think, rather, that the time has come, and the exigencies of the hour demand that the farmer give closer attention to the small details of mixed agriculture, and that he avail himself of all the resources and possibilities of the farm. The man on the farm, as well as any other place, who neglects the little things, and waits, Micawber-like, for some big thing to "turn up" before he acts, is sure to meet with failure in the end. Boys often make this mistake. They neglect the every-day routine of the farm, and are constantly wishing for some opportunity to do some great thing. They think if they were only placed at the head of some large mercantile enterprise, or had the superintendency of some factory, or could step

into the legislative halls, or be permitted to try their hand at running the government, then they would surely make things go and prove a great success; but these are not the kind of boys out of which leaders and rulers are made. A boy who does not give careful attention to the small details of the work *he has in hand* will never succeed in *any business*, great or small.

Men do not need new opportunities as much as they need to learn how to make the best of those they have—of the resources which lie all about them. You give some men the richest farm in the State of Missouri and they would not raise enough to keep soul and body together, when other men would take almost the worst land to be found and make it furnish a living from the start, and in time yield them a competency.

In one line I feel quite sure that the farmers have not made the most of the resources at their command. I refer to the poultry industry. I notice in the report made by the United States for 1889, that Missouri is classed first in poultry production, but fourth in eggs. While there is not much dependence to be placed upon such statistics, owing to the fact that it is almost impossible to get a correct record of the poultry and eggs of any given locality, yet the report is near enough correct to be suggestive, to say the least. On general principles, hens may be expected to lay eggs, and if Missouri has more hens than any other state in the Union and does not produce at the same time more eggs, then we may reasonably conclude that there are some faulty methods of handling poultry prevalent among the farmers.

One has only to make a trip through the State, as I did last year, and observe closely the value placed on the fowls of the farm in order to be convinced that this is the fact. While there are some farms where they are fully alive to the importance of this industry, there are hundreds of others where no special value is placed on the fowls, and the "chicken business" is considered entirely too small for the men-folk of the farm to give it any attention. The impression is given that hens will do very well for the "women to putter with," but they do not amount to much anyway. (I mean the hens do not amount to much, but I am sorry to say that there are some who would be perfectly willing to include the "women," too). On most such farms the poultry is left to "scratch for itself," and to roost wherever it can find a resting place when night comes, summer or winter. Any one who knows anything about the nature of fowls will not be slow in saying that wherever poultry is handled in this way, the farmers are not making the most of their resources.

But it was not my purpose to discuss theories as much as to call attention to some of the practical details which, as I have learned by actual experience, underlie success with poultry on the farm.

WHAT BREED?

About the first question one will be asked when he begins to talk poultry is, "What breed of fowls do you think are the best?" The idea that seems to suggest itself is that it is necessary to have some new breed in order to make the poultry pay. This is a mistake. The farmer who cannot make the breed he has profitable would better not try any new breeds, for this will not add in the least to his profits. I do not mean to say by this that the breed of fowls is of no consequence, but I do mean to say that the *how* of success should first be learned with the breed one has, and then it will be time enough to improve the breed. Here is a mistake made a great many times by those who start in the fancy poultry business. They seem to think that all that is necessary is to buy a few eggs, and raise a half-dozen or more each of as many kinds of poultry, and then build a few pens to put them in, and they will be on the road to success. They may not know a Wyandotte from a Plymouth Rock, or a case of roup from cholera, yet they think they are certain to succeed with so many breeds, as people will surely want eggs from some of them. Those who start in the poultry business in this way are very apt to have a lot of second-hand wire-netting for sale about the second season, and the lingering conviction that for some reason, they know not why, they never "had any luck with poultry," is about all of their stock in trade.

But to return to the breed. There are two breeds of fowls which are peculiarly suited, it seems to me, to the farm; and where one is about to begin, or has things fitted up so he can properly care for poultry, he would better get the best at the start. There is no question in my mind but pure-bred poultry is more profitable than mongrels, and my advice would be to secure a start of some kind of well-bred poultry just as soon as you are in shape to care properly for it. It may cost a little more at the start, but there is no doubt but what it will pay better in the end.

The Plymouth Rocks are an excellent fowl for the farmer, as they are good foragers, lay fairly well, make good mothers, have fair size and mature quickly. The only objection of a serious character that I ever had to them is—I came to this conclusion after five or six years' experience with them—that they are predisposed to roup. This may not be true, but I have had much less trouble with this fatal and annoying disease since I began to keep

GOLDEN WYANDOTTES.

They are about as pretty a fowl as one often sees. They have all the good qualities of the Rocks, and for me they have proven much better layers, and very much less predisposed to disease. I have tried a great many kinds of poultry, but I have never found any that are the equal of the Golden Wyandottes for all-the-year-'round layers. There are others which might prove even better, but, as I said at first, it is not absolutely necessary to have any of the pure breeds in order to make the poultry pay. There is no question but the fowls on any farm, where they are made up of what is known as "common stock," would be materially improved by introducing a pure-bred male of some larger breed than any found in the flock. This will add vigor, size and many other desirable qualities. The male should be changed every year, and should not be left to run with the hens after the breeding season is over, as the hens will lay better without a cock, and the eggs will keep fresh very much longer.

COMFORTABLE QUARTERS.

One of the essentials of success with any kind of poultry is a comfortable place for them to stay. Especially is this true with regard to a place for them to roost in the winter. Now, a hen can manage to live through a very cold spell and roost every night in a black-jack, or on the wagons, buggies or machinery of the farm; but her owner need not expect her to be very remunerative if he does not provide her any more comfortable quarters than these. The wagon, plow, and even the mowing machine may furnish places where a hen can find footing to rest over night, but it is rather hard on the farm implements, to say nothing about the comfort of the hen when the mercury crawls down to 15 or 20 degrees below zero.

The black-jack is not so bad during the summer, but surely no one will think that even a hen can be comfortable when the mercury reaches 10 below zero and the wind is blowing at the rate of twenty-five or thirty miles an hour, not to speak of the possibility of a pelting storm of sleet, rain or snow. Now, reader, just use a little common sense and reason about this matter, and think how you would like to go out during such a storm, squat down on a limb and sit there all night. Just think how petulant and pevish a man would be who had the tops and bottoms of his ears and the end of his nose frozen until they would turn black and part of them drop off. Then think what people expect of their hens. They leave them to roost in trees, or in places equally as bleak and cold, until their combs and wattles are

frozen, and after a time turn black and part of them drop off, and then wonder why they do not come off the roost in the morning snug and happy, and, having shaken the ice from their feathers, hunt up some bare spot on the ground and lay an egg every day. Let me say to you that they will not do anything of the kind. It is not reasonable; it is not common sense; it is not in accordance with the laws of nature to expect any such results from any breed of fowls. You can't blame the hen for not laying. I do not; and more, if I were a hen I would swear by the eternal, I never would lay an egg while I received such treatment.

POULTRY-HOUSES.

It is not necessary for me to tell how to make a poultry-house. There are various ways by which a farmer can construct quarters for his poultry so they will be perfectly comfortable, night and day, and that without much outlay. You know what is necessary to keep other stock warm and comfortable, and the same conditions will apply to poultry. There is more in this idea of keeping hens comfortable and contented in order to secure eggs than many people think. They not only need a comfortable place to roost, but they should receive such treatment as will make them contented all the time if one expects them to lay eggs. A hen, like many other animals, has a very delicate nervous temperament, and whatever excites her draws on her vitality and detracts from her egg production. Let me name a few things which interfere very much with the comfort of fowls. I will first mention *bad roosts.*

The orthodox roost for the farm hen-house of olden times started at or near the ground and went up, step by step, at an angle of about 45 degrees until it reached the roof of the building, if sufficient roosting space was not provided before. What was the result? All the hens and roosters in that farmer's flock tried every night to roost on the top pole. There not being space enough on this to accommodate the flock, of course some of them would get knocked off, and on their way to the ground would perchance knock others off; and this would go on until there was a general uproar among the fowls, which was repeated each evening, with variations. Hens that are excited and thumped around this way cannot do their best at egg production. The perches should be so arranged that the fowls can go to roost every night as quietly as the tired farmer seeks his comfortable couch. The roosts should all be made on a level, not more than 18 inches from the ground. They should also be made movable, so that they can be taken out and the hen-house thoroughly cleaned two or three times a week in the winter, and in the summer every day. There is nothing better

than a 2x4 for a roost. These should be made perfectly smooth—the smoother the better—fitting into notches in a set of trestles 18 inches high. If the corners are rounded off they will be none too wide, if fitted in the broad way. This will give a comfortable roosting place for all of the fowls on a level, and there will be no fighting for the highest perch. Before I leave the subject of roosts I will say that it is absolutely necessary to keep the house clean if one expects the fowls to be healthy. It will not do to clean it out once a year, or even once a month; but, as I said before, it should be cleaned at least once or twice a week.

After all of the droppings have been removed and the floor swept clean, sprinkle air-slaked lime or road dust all over the floor. This will make it more easily cleaned the next time, and the lime is a good deodorizer, and will also kill the germs of disease which may be lurking in the cracks. If the nests are in the hen-house, they should be cleaned out once a week and a careful search made for lice. By giving them a thorough washing each time with an emulsion of coal-oil and hot soap-suds, and then sprinkling some lime in them before the straw is put in, they may be kept free from vermin of all kinds, which is very important.

You may think that all of this is a good deal of trouble. Yes, it is some trouble, but it will pay in the end. However, when one goes at it systematically, it will not take so long each time as it has taken me to write out how to do it, and the best results cannot be obtained unless there is careful attention to all of these details.

Another thing which detracts largely from the quantity of eggs produced is the method by which some farmers secure a chicken for their Sunday dinner. This is neglected until about the time the fowl is wanted, and then there is a regular circus, which reaches all the poultry on the farm before the job is completed. Many farmers are well supplied with dogs of various kinds, sizes and ages. Most of them have at least a big dog, a little dog, and a dog between. When the time comes to secure the coveted chicken, the good housewife says, "John, do you see that old speckled hen with blue legs and a top-knot? I wish you and Henry would catch her for me." John calls the little dog, just as though it were possible to use one dog on a farm and not have all the rest volunteer help at once, and then the show commences. The big dog and the dog betveen join in, and Henry seconds the effort of his father in his wild flight after the fated top-knot hen. The good housewife comes to their aid and they chase that hen through the orchard, over the garden, under the barn, through the hen-house, if they have one, and so on until the hen, in her wild

and frantic attempt to escape, tries to go through a crack in the fence, which is about two sizes too small, and she sticks fast. The wife and mother rushes up, grabs her by the legs, turns her around, grasps her head firmly and gives her body a few rapid gyrations in the air, and then the head a sudden jerk, and her carcass goes whirling to the ground. After a few moments the hen for the Sunday dinner quietly settles down to her fate, and is soon boiling or roasting on or in the stove.

Now stop and think of the result of such a performance. In the first place, every hen on the farm becomes greatly excited each time this exciting drama is gone through with, and for an hour after none of them can be seen. They have found hiding places all about the premises, and if you watch you will see them stick out their heads occasionally, after the racket has all quieted down, in order to see if it is safe for them to venture out. If there are fifty hens on that farm, that Sunday dinner cost at least half that many eggs, for hens are sure to stop laying when scared in this way. They will not stop all at once, for they cannot, but in a few days there will be a decrease of eggs. Then again, that is rather a barbarous way to kill a hen; and last but not least, she is really not fit for human food after having gone through such a chasé. The way to catch chickens is to quietly pick them off the roost at night, or as quietly pick them from the ground in day-time, for, if properly treated, they will be so tame that this can be done. The way to get a hen's head off is to cut it off at one stroke, and it is useless cruelty to wring it off.

I might give other illustrations of how hens are cuffed around and frightened, and the quality of the eggs which they would produce cut down, but I think I have said enough on that subject. Quietness, contentment and cómfort are necessary adjuncts of egg production, and this should not be lost sight of for a single moment in handling fowls.

DISEASES OF POULTRY.

I was tempted to write the disease of poultry, for there is practically only one disease that causes any great loss among the fowls of the State as far as I know, so that when I have described this one disease and offered some suggestions as to its prevention and cure, I have very nearly covered the ground of poultry ailments.

Let me, in the fewest words possible, describe this disease, so you can tell whether your poultry has it or not. You go out some morning and find one of your hens with one eye about half closed and a thin scum over it. The comb and wattles are intensely red, and when the hen tries to walk she turns her head to one side and staggers as she

goes. She will eat and drink, and would apparently be all right only for the difficulty mentioned; but if you will put your hand on her head you will find that it is hot and feverish. If you examine her throat and tongue, you may find the latter covered with a thick, cheesy substance, and sometimes this extends down onto the top of the windpipe and becomes quite large. When removed, the wound left at the point of contact will bleed. The throat will be found to be inflamed and red. Or you may find a hen that refuses to eat, but does not seem to have anything else wrong with her. If you will listen closely, you may hear a gurgling, wheezy noise in her throat. If this difficulty has become very severe, she will throw her head back and fairly pant for breath, or she may not show any of the symptoms given above, except she will refuse to eat, stand at the drinking vessel and take a swallow of water very often, and occasionally pass a thin, watery stool. Or, again, she may sit in a sunny place with her head drawn down in her feathers, her eyes dull and half closed, and her feathers turned back, all of which gives her a droopy, disconsolate appearance. When she starts to walk she staggers, and if hurried, falls over and lies there, being too weak to rise. She has the disease in its worst stage, and has gone beyond the possibility of recovery. Now, all of these symptoms point to a disease as contageous as small-pox, and as deadly as consumption in the human family; for it is much like consumption, if it is not caused by a germ that is very similar. It is a germ disease, and can no more arise without the presence of the germ than one can rear a crop of corn without any seed.

Whatever weakens the constitution of the fowl, or irritates the mucous membrane of the lungs, throat or wind-pipe, makes them more susceptible to an attack of this germ, as a strong, healthy fowl can resist its ravages and throw it off, even though it finds its way into the system. The disease is not caused by drafts, dampness, nor anything of that kind, but all of these furnish favorable conditions for an attack, as do also filthy quarters and dirty drinking vessels, or impure food. This disease must have a name, and we call it *roup*. Some call it *pip*. This, however, refers more especially to one form of the disease, but it is one of the most dread diseases with which the poultry keeper has to contend.

The treatment must be persistent and heroic if one has any hopes of success. *Prevention* in all diseases *is better than a cure*, but this is especially true of this disease, as it is so very contagious and the germs have such tenacity of life. In the line of prevention, clean quarters is one of the things of first importance, as said before. The hen-house should be kept absolutely clean. There is simply no use

trying to eradicate the roup, if it is not cleaned out every day and kept clean by the use of air-slaked lime and thorough fumigation with sulphur. Attention should be given also to the drinking-vessel, if you have one; and if you have not, you should get one, for fowls need *water* twice a day, and the drinking-vessel should be thoroughly cleaned each time before putting in the water. The fowls should be furnished with warm, comfortable quarters, free from cracks and dampness, and they should never be permitted to roost in a draft. They should also be fed good, sound, sweet food. The practice of feeding fowls musty wheat, mildewed bread and other spoiled and filthy food is a very bad one. It not only leads to disease, but injures the flavor of the flesh and eggs. We want to eat the fowls and their eggs, and we should not feed them filthy food, as this is the material out of which they have to make fiber and eggs if we give them nothing else. Who wants to eat flesh made out of filthy food?

Another important thing in the line of prevention is the removal of all fowls from the flock as soon as they show any signs of the disease. If one is found in the worst stages, the best thing that can be done is to cut off its head at once and burn the entire carcass, head and all, or else bury it so deep that there is no possibility of the carcass finding its way to the surface. Do not let any of the well hens have access to even a drop of such a fowl's blood, for one drop of blood may contain germs enough, if opportunity for proper development is offered, to poison a thousand hens. Some people let the other fowls eat the dead carcasses of sick fowls. In a case like this they would just as well let them eat deadly poison. Then to think of eating these fowls after they have thus regaled themselves! Whew! what a taste one must have to relish such food!

Now for the treatment. If the fowls are taken in time, before the disease reaches any of its malignant stages, they can be cured.

Clean up first. Then at night, after the fowls are all on the roost, take an iron kettle, put some live coals on it, set it down in the center of the roosting place, far enough away from the fowls so as not to burn any of them. Throw on the coals about a tablespoonful of flour of sulphur, which has mixed in it about half as much pulverized saltpetre. Close the door and let it burn. It will make the fowls cough and sneeze, but there is no danger of hurting them, if you do not make it too strong. However, it is best to stay near until the mixture is entirely burned up, and if any of the fowls show signs of strangling, open the door and let in some fresh air. If not, leave the door closed and let them breathe the gas all night. The next day many of them will show improvement. Repeat the process every other night until there are

none of the symptoms manifested. Some day when the fowls are out, put in about one pound of sulphur and give the house a thorough fumigation. No use to do this unless you do it well, and a few ounces of sulphur will not answer.

By this treatment I have cured some very bad cases of roup, and it is the only treatment I have ever found of any value.

There are other diseases which I might mention, but I have taken all the space allotted to this subject, and will have to leave them for some future article. I will say, in conclusion, that all I have said with regard to *prevention* will apply to any disease.

One word of caution: Do not get too many fowls on the farm and overdo the matter, for if you do, you will be sure to be money out of pocket.

Bee-Keeping.

More attention than usual has been attracted toward this industry during the last year, on account of the meeting of the North American Bee-Keepers' Association, of which a citizen of our State, Emerson T. Abbott, was president, at St. Joseph, in October last.

This society represents the industry in the United States and Canada, and as apiculture is a growing and important branch of agriculture, we have thought best to give it a considerable space in this report. While it may not seem to have become sufficiently advanced locally to justify giving it so much attention, yet we feel that bee-keeping is of very great importance to the farmers of the State. It already adds largely to the income of our people, and we firmly believe that the profits derived therefrom will be greatly increased in the near future, as our citizens become more acquainted with the tools and methods of modern apiculture and its possibilities in our State. There is scarcely a locality in the State where a few bees may not be profitably kept, and some parts of the State are especially suited to the profitable carrying on of this industry in connection with mixed farming.

As advanced methods of agriculture are introduced, and our people, as a result of this, give more attention to the growing of berries, orchards, small fruits and the clovers, the possibilities of apiculture in the State of Missouri will be greatly increased. Believing this to be true, and thinking that it would be in many ways profitable to our readers, we present herewith a lengthy report of our doings of the convention referred to above.

On the evening of the first day, which was devoted mostly to routine business, Pres. Abbott introduced Secretary Rippey, who was present by invitation, remarking as he did so that the Secretary was doing more just now to advance the interests of apiculture than any other man in the State, as he was giving the industry the attention its importance merited. Mr. Rippey responded with a few well-chosen remarks, and then introduced Mr. Terry, who gave one of his interesting talks on clover, which was very timely and fitting, as the clovers are all excellent honey plants.

On the following day a number of essays on bee-keeping in other countries were read, and as these will give an idea of the general importance of the industry, and at the same time furnish information of interest to the general reader as well as to bee-keepers, we give below the leading points in a number of them.

The first one was written in German and was translated by Secretary Benton, who said by way of introduction:

"It will be remembered that Mr. Gravenhorst is an honorary member of this Association, having been elected at the Washington meeting, and is a man of long experience in bee-keeping matters, one of the leaders in Germany, and a very practical writer, being the author of an excellent text-book on this subject. He was educated for a teacher, but his hearing having become impaired, he was obliged to seek some other occupation, and this he found in the keeping of bees."

APICULTURE IN GERMANY.

By C. J. H. Gravenhorst, Wilsnack, Prussia.

The keeping of bees in Germany is very old. Records which show this reach back 400 years before the Christian era. Peinius records the finding in North Germany of a honeycomb eight feet long, taken from a log hive: that is, a hive hewn out of a tree trunk. He tells how the old Germans followed the keeping of bees in the forests and in the gardens, in living trees in which a lodgment for the bees was hewn out, or in hives which they had cut from the trees and placed near their dwellings. Especially the Slavic laws prove that already in the fifth century of the Christian era, covered as well as uncovered bee-houses existed.

The greatest development which apiculture has ever had in Germany occurred in the so-called Middle ages. This began, however, with the introduction of Christianity, from which time on the consumption of wax in the shape of candles and tapers constantly increased. The information which has become avilable to us through the writings

left by monasteries and churches, proves through the records of taxes for honey and wax which had to be met annually by the peasants, that bee-keeping yielded enormous returns. Thus it came about in the Middle ages that the trade in honey, wax and mead reached its highest prosperity. This flourishing of apiculture was greatly aided by the great attention paid to it by princes and owners of great estates. The so-called Zeidler societies were founded. These were composed of those who were engaged in the care of bees, and also such as were engaged in collecting and straining honey and clarifying wax, and were called Zeidler. These Zeidler societies formed closely allied branch associations, which were given special rights and privileges. The strictest laws protected them. Only skillful bee-keepers were accepted as members. They elected judges and elders from their own number. The forests were divided off into districts, and each district was under a Zeidler, while several districts formed a society which, in most instances, managed large numbers of colonies. The Upper Lusatian Zeidler society, for example, had 7000 colonies. The Zeidler system was especially flourishing in the mark of Brandenburg.

After the Thirty Years' war apiculture made exceptionalpr ogress on the North German plains, as, for example, at the mouths of the Ems, the Weser and the Elbe, and especially in that portion which today is included in the province of Hanover, and the adjoining lands, where endless areas, covered with *Erica vulgaris* and here and there buckwheat, offered to the bees a good autumn harvest. Here bees were kept, and are still kept today, in the round, bell-shaped straw hives. The apiarian societies which are scattered all over Germany have had the greatest influence upon the spread and elevation of apiculture. We have in the first place the separate societies, which are made up of members of a given locality. These societies meet monthly, half-yearly or yearly. A number of these societies form, in the several lands or provinces of a state, so-called central associations. Nearly all of the central associations, that of the kingdoms of Bavaria and Wurtemberg excepted, have banded themselves together to form a German Central association, which thus numbers about 20,000 to 30,000 members. All of the separate central associations receive subventions from the state. The Mark association, for example, to which I belong, and which is composed of 83 separate individual societies, having about 1680 members, receives yearly about $300. Other societies more, and others less. Notwithstanding all these extraordinary exertions, the elevation of apiculture in Germany proceeds only slowly. Indeed, it has even gone backward in the last twenty years, but is now on the increase, especially the method with movable combs.

It should be noted here that in Germany little comb honey is produced, there being for the greater part no market for it. From the hives with fixed combs the best honey that is obtained is what is called run honey, and it approaches extracted honey very nearly in quality. The crushed combs are placed in a sieve or a trough and the honey permitted to run off. What remains is gently heated and strained. Extracted honey and run honey are sold on the average at 25 cents per pound, the strained honey 12 to 13 cents per pound. Comb honey and extracted are the same in price. The honey is gathered chiefly from fruit-bloom, rape, esparcette, acacia or honey-locust, linden, corn-flower, buckwheat and heather.

So far as the hives are concerned in which bees are kept in Germany, the bell-shaped straw hives are most widely used; the few log or box-hives or other hives with immovable combs are not worth consideration. The confusion in the construction of hives with movable combs is infinitely greater in Germany than in America. The great majority of these hives are built cupboard-like, with several stories, one above another, which open at the sides where the gables are placed, or from the back end. The frames in these hives, quite in contrast to those in American hives, are placed with the longer dimension perpendicular. The full-sized German standard frame does not differ greatly as regards its contents from the Langstroth frame. American hives have been but little introduced, or not at all here.

BEE-KEEPING IN AUSTRALIA.

By W. S. Fender, West Maitland, New South Wales.

Bees are mostly kept in any convenient box that can be found. In some places the joints are so open, through warping and splitting, that the bees and combs can be seen from quite a distance. Sometimes the hives are sheltered with sheets of bark, rough boards, etc.; at other times under a shed. After a swarm is placed in a hive no further care is taken of it until the autumn, generally the end of February, when they are driven to another box and allowed to do the best they can for winter. In many localities in a favorable season these driven bees will build complete combs, rear brood and store sufficient honey before winter, which they will come through in very strong condition.

Since the introduction of the frame hive and Italian bee many have adopted the more modern methods of keeping, which is carried on similarly to the American bee-keepers. In fact, American bee literature is what is mostly in circulation, and the methods there de-

scribed seem to suit this country very well, when modified to suit our honey-flows. Our climate is such that very little attention is given to wintering bees, beyond seeing that they have about ten pounds of stores, a good queen and a water-tight cover. In the warmer parts the amount of stores for winter gives no concern, as there is generally sufficient food to be obtained from something, as grasses, weeds, under-scrub, etc., if there should not be a winter honey-flow. To give an idea of what a winter flow is sometimes like, I will cite the following:

During the season of 1892 Mr. M. Scobie, of West Maitland, N. S. W., started the spring with seventeen hives of black and hybrid bees, anticipating favorable weather for the following winter. Noticing that the spotted gum trees were heavy in bud (the buds of this tree are from fifteen to eighteen months from time of forming to bursting), he allowed, or rather encouraged, his bees to swarm; hived all first and after-swarms on comb foundation, and by April had ninety colonies, when the trees burst into bloom, and before the end of June 7,000 pounds of honey were extracted. This is very encouraging, is it not? Now for reverses. The past season has been very wet. That same bee-keeper started with 172 colonies, from which he did not get one pound of honey, and then had to feed some of his stocks for winter.

In some seasons the trees seem to arrange their time of blooming to make one continuous flow from August to the following June, with very little break between; and during such a season, with proper management, I believe it is quite possible to average 500 pounds of extracted honey per hive. These seasons are scarce, but taking one season with another, an average of 150 pounds per colony in bushy (forest) country, and 40 pounds when bees have to depend entirely on cultivation, is obtained. The statistics do not paint things so brightly, but it must be remembered that at least 80 per cent of the hives are boxes, in which a swarm is placed to take its chances.

The hive most generally in use is the Langstroth, with simplicity, size of frame, with all its modifications.

At present fully as much honey is produced as a market can be found for, but as foreign markets are being opened up, our home markets will be much relieved.

The wax produced is of the very finest quality, and is varied in color from a pure white to every shade of dark and canary yellow, and some even has a pinkish color. This white wax direct from the combs is very tough, and quite different from that made white by bleaching. What is it that gives wax its color? I frequently find my bees build and seal their stores with wax quite a canary yellow in color. Now, seeing that our honey is so varied in color, and that wax is a secretion-

ary production, is it not most reasonable to expect that the difference in color is due to the difference in the food rather than impurities?

Bee-keeping as an occupation is quite practicable here. There are a number who follow the pursuit wholly as a business, and others are going into it.

BEE-KEEPING IN CANADA.

By R. McKnight, Owen Sound, Ont.

Nearly 40 years ago, and while this province (Ontario) was yet but thinly settled, I knew an expert bee-hunter to bring home tubfuls of honey from the pine forest. Where the bees that collected it originally came from I know not, as none were kept within many miles of the place.

The conditions under which the bees lived, however, were favorable. A hollow pine tree, with its warm padding of dry, decayed wood, was a congenial home for them. In no modern hive do we find conditions so favorable to the well-being of a colony as these hollow giants of the forest furnished. Surrounded by a shell a hand's breadth in thickness, lined with the best kind of absorbent, a solid trunk above, ample space below, with a "punk-hole" for an entrance, they gave comfort, accommodation and protection, surpassing that of any modern contrivance of the hive-maker.

It was to these old-time bee-trees that our earlier bee-keepers were indebted for their stocked "gums," the progeny of which, modified and improved by the admixture of new blood, constitute the present working force of our bee-keepers. The box-hive succeeded the bee-gum, and was for years the best known method of housing bees.

When the movable frame first came into use in Canada, I am unable to say; nor do I know who introduced it. Both it and the extractor were known of, and their advantages understood, some years before either came into general use. * * * * * *

Years have come and gone since then, and it is not too much to say that in the interval Canadian bee-keepers have made a place for themselves in the apicultural world, of which they have no reason to be ashamed.

I shall now briefly advert to the agencies employed in bringing about this result, some of which are the creation of our own people, and serve to exemplify their character. In intelligent application of detail, combined with a thorough knowledge of the principles involved in their work, they have no superior. To these characteristics may be attributed the high level they occupy in the apicultural world. Among them may be found as large a proportion of men skilled in all that per-

tains to their calling as any country can produce. This manifests itself in the output of their apiaries. But they have enterprise, as well as intelligence. The substantial aid they have secured for the industry proves this. Organized effort is what has brought them this aid. In other words, the Ontario Bee-Keepers' Association is the agency through which it has been obtained.

During the first five years of the association's existence it had no material outside assistance, but was steadily working with that end in view. In 1886 it became incorporated by act of Parliament, with an annual grant from the public treasury of $500, and the free publication and distribution of its annual reports. Later on it secured the appointment of a fowl brood inspector, at a cost to the country of another $500 yearly. (The inspector is a provincial officer under the guidance and control of the association.) Add to these achievements the procural of at least $5000 of the public money, granted and expended in connection with the London and Chicago honey shows, and it presents a record of activity and success that will challenge comparison with any like association in the world.

The association has not contented itself with securing incorporation and its attendant money grants, but has sought to attract attention to the excellence of our honey by large and attractive public display of it. Its first great effort in this direction was made in 1886, when, at the Colonial and Indian Exhibition in London, four of the association's delegates set up the largest display of honey ever yet made. It exceeded in quantity the combined displays of the Chicago fair, and attracted the attention of the world to the honey-producing capabilities of Canada.

Advantage is also taken of the opportunity the Toronto Industrial Exhibition offers to keep the product of the apiary before the people of the province. Though the industrial is largely a Toronto enterprise, it has much of a provincial character. Its directorate embraces delegates from all the incorporated industries in Ontario. Our Association is entitled to two members on its board, through whose instrumentality very liberal prizes are offered for honey and bee-keepers' supplies. The prize-list makes it possible for several exhibitors to carry off $100 in cash, and one or more medals besides. The exhibitor is also accorded the privilege of disposing of his honey at retail, providing he does not impair the attractiveness of his exhibit. The show lasts ten days and is largely attended by people from all parts of the Dominion, thus offering inducements to exhibitors rarely found outside its grounds. Advantage is taken of this annual opportunity by a number of our best bee-keepers to make an exhibit of honey that is alike a credit to them-

selves and the industry they represent. These exhibitions have had no little effect in securing a home market for the honey produced in the country, at prices that cannot be exceeded in foreign markets.

I shall not even attempt to give an outline of the style of hives used in Canada, or the system of manipulation prosecuted, as they are both practically identical with your own.

In closing, let me extend to the ladies and gentlemen present at St. Joseph a fraternal greeting, assuring you of my earnest wish that your first national meeting in the far West may afford pleasant reminiscences to those present, as I have no doubt it will be profitable to the brotherhood of bee-keepers everywhere.

BEE-CULTURE IN FRANCE.

By Chas. Dadant, Hamilton, Ill.

The recent progress in bee-culture has been accepted very slowly in France, and I think that this slowness can be attributed to the profits obtained by the methods used in that country before the invention of the movable frame, and to the relatively advanced knowledge of bees, as well as to the poor results given by the first experiments made with movable combs and frames, which were, at first, far from giving as good results as the straw hives, with or without surplus caps, or made two or three stories high.

A considerable industry in honey production had grown not far from Paris, in Gatinais, where the best known honey-producing plant, the sainfoin, or esparcette, was largely cultivated. This sainfoin (healthy hay), which belongs to the leguminous family, like alfalfa and clover, and which, unfortunately, does not succeed here, not only gives the best food for farm animals, but it gives also the best honey, and about as abundantly as the sage of California. Yet, as the flowers of Gatinais, save during the blooming of the sainfoin, were unable to support a number of bees adequate with the honey which could be harvested in this part of the country, its bee-keepers became bee-buyers and bee-killers; so two large occupations, one of rearing bees, and the other of harvesting honey, were created.

For several hundred miles around most of the bee-keepers reared bees with the purpose of producing, not honey, but swarms, which were sold for from three to four dollars apiece in the spring, some *Gatinaisiens buying a thousand of them or more.* These swarms, transported to the fields of sainfoin, were smothered with sulphur as soon as they had filled their hives, to get their honey and beeswax.

As this mode of bee-culture, or rather bee-killing, was profitable to both the bee-breeder and the bee-killer, progress to them was unde-

sirable, for they anticipated that a change of method would ruin their business by teaching bee-keepers at large how to produce honey without destroying bees.

Such was the condition of bee-culture in France when Mr. Bastian tried to introduce the German movable hive, and Mr. L'abbe Sagot a hive of his own invention, with a movable ceiling, like the Langstroth but smaller in size. Both these bee-keepers had described their hives and methods in the *Apiculteur* of Mr. Hamet, when one of my neighbors, while in Paris, visited this editor to subscribe to his paper for me. Mr. Hamet entreated him to ask me to send him some articles on bee-culture in the United States. Of course I complied gladly, especially when I saw how far behind France was in bee-culture.

It was in 1868. My first articles were welcomed, but as soon as I began to praise the Langstroth and Quinby hives, ranking them above all the fixed comb hives, Mr. Hamet, becoming angry, was so impolite that for several years nobody cared to write for his paper anything in favor of the movable comb. Fortunately, some agricultural papers were ready to accept our writings; and, besides, one or two other bee papers were started, but they did not last. Then Mr. Ed. Bertrand began, in Switzerland, the publication of the "Revue Internationale d'Agriculture," which has scattered the knowledge of the new hives and methods, not only in Switzerland, but in France and Belgium, and even in Russia, where the French language is spoken by the high classes. Now, in spite of all the opposition, the movable frame goes forward in France. Unfortunately, although the hives have movable ceilings, like the American, there are too many different sizes and shapes of frames in use, and their number has been on the increase. To sum up: The movable-frame hives are not as prevalent in France as in the United States, yet their progress is increasing every year, and their adversaries have vanished. I may add that, after comparative experiments, the preference of the majority of bee-keepers using the French language is incontestably in favor of a frame and hive far larger than the regular Langstroth.

A number of other papers were also read, some of which have been condensed to suit our space.

DISPOSING OF THE HONEY CROP.

By Geo. W. York, Chicago, Ill.

Page upon page has been written on the subject of marketing honey, for all realize that unless it is well sold, there is no profit or just remuneration for the labor and skill involved in its production.

A successful marketing of honey presupposes its good quality, and suitable condition for proper and satisfactory handling. Possessing these two very important factors, the honey is then ready to seek the much desired customer.

Upon what market shall it be placed? Aye, that's the question! Shall it be disposed of in the home market—probably among the producer's friends and neighbors—or shall it be shipped to the nearest large city to find purchasers? Both ways have their advantages, as well as disadvantages. So much depends upon the producer himself, that what might be best for one kee-keeper would be all wrong for another equally successful in honey-production.

Each producer, of course, desires to realize the most money possible for his crop. Upon that point all will agree.

I fully believe that the best solution of the question will be found in the home market where the producer can personally look after the details of the work; and, although unable to do the actual retailing himself, he can so supervise it so as to realize the largest proceeds from the sale of his crop of honey.

Of course, it requires a good talker to sell honey, as well as any thing else that has merit which needs to be shown to the desired pur chasers. But, as nearly everybody likes to eat honey, it should not be such a difficult task to dispose of some in nearly every home visited.

As to the price to be asked, certainly the city market quotations should not govern, for, as I have shown, that market may have become over-stocked and for the time being the price lowered to such an extent that there could be no profit whatever to the producer.

It has been suggested that unless a good price be asked, it will not be secured. And there is more truth than poetry in that hint. Though, if the price asked be too high, there will also be less sales, and consequently less money obtained, but more honey left on the producer's hands.

There is much in education in this matter of the price of honey, as well as to its constant use in the family. By starting out rightly, a better price can be secured and maintained, and also more sales be made, while if there is a wrong beginning, it will be well-nigh impossible to correct it later on. By all means study the consumer's ability to pay, supply a pure article of honey, put up in an attractive form, and there will be little trouble about future orders after the first purchase is made and used.

I think that bee-keepers who have a home market well worked up often make a very great mistake when they allow themselves to get out of honey for sale at any time of the year; for if a regular customer

can get no more honey from the producer who has been supplying him, he will likely apply to the grocery store, where he may be supplied with a mixed article at a less price, and also correspondingly inferior in quality, though it may, after a time, give partial satisfaction. The result will be that the next time the honest producer wishes to sell that customer more honey, he will expect to furnish it at very nearly "store prices" for a superior article. To avoid such an unfortunate condition of things, I would always have honey on hand, even if it be necessary to get it from a bee-keeper at a distance, but always being sure of his honesty and reliability.

I am sure that the home market for honey has undreamed-of possibilities for successful development, and the wide-awake, progressive twentieth century honey-producers will find in it a veritable gold-mine in exchange for their pure, golden honey—nectar fit for the gods, and hungry humanity's best food and medicine.

This paper called out quite a lengthy discussion, and the following are some of the points of interest:

R. F. Holterman—I should like to have this convention discuss one subject, and that is, whether a producer should ever get out of honey, or whether he should buy from other producers to fill the demand he may have.

F. H. Richardson—No, sir-ree! I would not do that. I would sell only my own honey. I would not sell any that was not mine, and say it was.

Mr. York—You would not have to do that. All we have to do is to guarantee the honey to be pure honey.

C. P. Dadant—We have found that we have had to handle honey that was not our own. When the crop was short we found that it was very easy to sell honey that was not our own, by putting our label on it. We tell them it is not our own honey, but when they see our label on it they take it as soon as they would our own. If they would not see our label on it, they would think that we had "manufactured" it. If we tell them that we will guarantee it, it is all right. It is sufficient for them if we will guarantee it.

Pres. Abbott—I have been compelled to sell Dadant's honey.

Dr. Miller—I think it is a good thing in two respects. When a bee-keeper has more honey than he needs, and one has less than he needs, and buys it, then it is a good thing.

President Abbott—I have had a little experience in this honey-selling business. I have lived in St. Joseph for ten years. The first four or five I did a good deal by way of selling my own honey, but I have seldom had honey enough to supply the demand when I have

pushed the business. For the last two or three years I have tried not to sell rather than sell. During that time I have been able to build up a market that is of a character that every man should have; a market that simply takes my word for it, because they think I know what honey is. They never ask me if I produce the honey. If they should, I would tell them no. They don't ask it, because they have become acquainted with me, and they know when I sell them honey that I know what honey is, and they take it for granted that I will give them a good article or I would not bring it to them at all.

Dr. Miller—There has been as much harm done to our market by having a poor honey on the market as by anything else.

E. Whitcomb—While I regard the home market as much the best, I don't think it is a good idea for a man to force his honey on the market. The manner in which it is put up is what sells it. That is what catches the eye of the buyer. Among our own buyers they take our word for it, and they take the honey in their own packages. That is the most profitable custom, because you have no package to buy.

President Abbott having made some remarks about sugar candy for winter feed, by motion of Mr. York he was requested to prepare a paper on that subject for publication.

THE WINTERING OF BEES.

By Emerson T. Abbott, St. Joseph, Mo.

I will give what seems to me a positive and easy solution of the winter problem. It will be necessary first to get a few simple facts fixed clearly in the mind. It is important to remember, first, that in this climate bees do not freeze in the winter, but starve. I am half inclined to think that this is true in any climate where bees are kept. If I were asked to state the secret of successful wintering in a few words, I would say, "Plenty of food in the right place." The right place is above the cluster. Let me explain why this is true:

Every one knows that it is a natural law that heat rises, and those who are at all acquainted with the habits of bees, know that as soon as cold weather sets in they will form themselves into a compact cluster near the center of the hive. They do this in order to keep themselves warm. One bee alone, especially if its honey-sac be empty, will perish in the cold in a short time, while a cluster of bees with well-filled honey-sacs can resist the hurtful influences of intensly cold weather. By uniting in a cluster they build around themselves a living wall, as it were, which is a non-conductor of heat, and thus are enabled to confine the combined heat of their bodies in a small space. Should one thrust a thermometer into the center of a cluster of bees in the winter,

he would, no doubt, be surprised to find how warm they can keep themselves, if he had never before tried the experiment.

When the bees on the outside of the cluster have endured the cold as long as they can, they step aside and pass into the center of the cluster, where it is always warm, and other bees take their places in this living wall of protection; and thus the cluster remains perfect as long as the cold weather lasts.

Now, this cluster, as a whole, can move only one way, and that is in the direction in which heat always moves—upward, as stated before. It can follow the line of heat, but it cannot move sidewise from one frame to another, or lengthwise on the frames. If one will think for a moment how most modern hives are constructed, and how shallow the frames are, he will readily understand why it is that so many colonies of bees die in the winter with "plenty of honey in the hive."

In the months of January and February, even in this climate, there is generally a long spell of very cold weather. During this time the cluster is moving toward the tops of the frames, consuming as it goes all of the honey in the frames immediately above it. The cold weather continuing, it finally reaches the top of the frames, and can go no farther in this direction. It cannot disband and move over to other frames, neither can it move lengthwise on the frames it now occupies What is the result? Having consumed all of the food in their honey-sacs, and not being able to reach any more nor live on wood, the bees die of starvation.

We must devise some method by which we can guard against such mishaps as mentioned above, and thus be able to take our busy little workers safely through the winter, and keep them strong and healthy, so they will be ready for brood-rearing in the spring.

It is very important that bees be kept as quiet as possible after they cease work in the fall. A worker-bee has a very delicate nervous organization, and therefore wears herself out in a short time when she is actively engaged in storing honey. If she is to live during the winter and long enough in the spring to rear bees to take her place, she must be excited to as little activity as possible after her honey-gathering ceases. It is not only necessary, then, to feed the bees so that the food will be above the cluster, but it is also important to feed them so they will be disturbed as little as possible.

A colony of bees will live through the winter and keep healthy if they have nothing but dry sugar to eat, provided the sugar be so placed that they can always reach it without breaking the cluster. Dry sugar, however, cannot be manipulated in a way to guarantee this condition of things. I, therefore, secure the best quality of granulated

sugar, and make it into solid cakes similar to those of maple sugar which we find for sale in the stores. To prepare these sugar cakes, the granulated sugar should be put into a vessel with a very small quantity of boiling water—not more than one pint of water to five pounds of sugar—and the sugar thoroughly melted. Be careful not to let it burn. After the sugar is melted, let the syrup boil until it will harden into a solid cake. One can ascertain when it has boiled enough by dropping a little of it in cold water. After it has boiled so it will thoroughly harden, pour it out into shallow pans, making it into cakes six or eight inches long, an inch and a half thick, and wide enough to make the cake weigh eight or ten pounds. When the cakes are thoroughly cold and hardened, they are ready for use.

Having prepared your cakes of sugar in this way, remove the top of the hive and the covering to the frames, and lay three or four sticks, one-half inch square and six inches long, directly over the cluster, placing them about two inches apart. Lay the cake of sugar on these sticks, and over this place a cloth sufficiently large to cover the entire top of the hive. An old grain-sack makes a very good covering for this purpose. Over the cloth place two or three thicknesses of old paper, and tuck all down snugly inside of the hive. After this is done, put on the hive cover. The idea is to make the covering above the bees perfectly tight, so that there is no upward draught.

As I said before, the cluster always forms on the combs below the food, and as it moves upward, it consumes the food immediately above it until it reaches the top of the frames, when the bees will find themselves in contact with the sugar candy. The warmth and moisture arising from the cluster will keep the sugar sufficiently soft so the bees can eat it without any trouble. I have never known a colony of bees thus provided with sufficient sugar to take them through the cold weather, to die or to come out in the spring diseased.

The following are a few of the subjects that were introduced during the meeting by means of the question-box, and a few of the remarks made thereon.

"What is the most desirable honey package?"

F. A. Richardson—I use for my extracted honey a sloping tin-pail, neatly labeled, on account of its being very convenient to handle, and by proper labeling you get a very neat package.

L. D. Stilson—I run for extracted honey entirely, and I put all of my honey up in glass. When a customer comes to get my honey, I am not ashamed to hold it up to the light for him to look through. We use nothing but glass.

C. P. Dadant—I don't believe in that. Pure honey will granulate and you can't look through it.

Mr. Stilson—Whenever we put it up for customers, we put it up in tin or wood. We never put it up for market until it is ready to be used.

Dr. Miller—There is no way in which honey looks so nice as in glass. Honey will granulate, and you will have to teach your customers that it is honey that can be depended upon, and then you will not have so much trouble with it.

J. T. Calvert—It is said that the sage honey of California must granulate to show that it is pure. I simply raise the question.

Dr. T. J. Conry—Alfalfa honey will granulate in a week.

W. L. Porter—I have used a tin pail, and have used a great many thousands of them, in the last few years in Denver. We find that glass packages have a greater demand than the tin. I have a package here that I brought out of my stock, and that package has some advantages. We can put it in the stores to sell to our customers, and we can offer 5 cents for the jar. If it is returned it is worth that to us, and if it does not come back it is worth that to the customer who gets it. I have used the square jars and the round jars, but I find that the square jar is not as valuable as the round one when the honey is all used.

Mrs. Thos. Strawbridge—I find that the Mason jar is the most desirable package for my market. Tin was not a success in marketing my honey. I use the quart Mason jars.

E. Whitcomb—My home demand is for the one and two pound sizes. We tell them to bring back the jar or crock and we will give them 5 cents for it. The honey is 15 cents and the jar 5 cents. Bring the package back and you will get your money back.

Mrs. J. M. Null—I use the 60-pound cans—from the 60-pound size to the half-gallon size in tin, and from the half-pound glass self-sealer to the half-gallon self-sealer, for extracted honey.

"Spring dwindling—its remedies and prevention."

Mr. Root—The cake of sugar is all right.

Mr. Holterman—Winter your bees right. Your climate is different from ours in Canada, but I think the general conditions are the same. I think it is on account of improper wintering. Poor wintering reduces the vitality of the bees to such a low state that before they can rear young bees they die off. I carry the bees into the cellar and tier the hives up one on top of the other, with a cushion over them. The last year or two I have adopted the plan of raising the back of the hive three-eighths of an inch, and I find that a very satisfactory way.

Mr. Whitcomb—I think it is on account of a lack of water early in the spring that causes the bees to fly out. I mean the lack of water near the hives. The bees come out on warm days and fly about for water, and if there is none near the hives they will fly farther. They drink the cold water, and it seems to paralyze them so they cannot get back to the hive, but die. I have adopted a system of watering my bees, and I have no trouble now with spring dwindling. I take a block of wood five or six inches square, and cut grooves from one corner to the other almost to the edge. They will cross in the center of the block. I then take a common fruit-jar, a quart jar, and fill it full of water and invert it on the block. These little grooves will fill up, and it will be replenished as the bees take it up. I set this right near the hives, and the bees can then get all the water they want without flying long distances for it and getting chilled. I have found this to be a sure preventive of spring dwindling.

"Is it desirable to have supply dealers who are not bee-keepers at our convention?"

Mr. Benton—Yes.

J. T. Calvert—I will say this: that I have had charge of the apiary of A. I. Root for three successive years, and I am still interested in bees.

Dr. Miller—This shows you what a bad conscience will do. There has been too much a feeling that there is a certain amount of antagonism between the supply dealers and the honey dealers; betwesn commission men and honey producers. Just take the supply dealers, if you please. Do we want the supply dealers to exist? Will you and I be better off if they are all hanged? Take the matter of sections: I would not want to sit down and make them myself with knife for $5 per thousand, and that is what the best will cost. And the very fact that we can get them so cheap is on account of these men here spending time to try to find out how they can make these things for us. They are our friends. There has been a feeling here that we don't want anybody here but bee-keepers. I think that we want to have our friends with us, and sometimes they suggest things to us that we want to know. I think this ill-feeling should be done away with. I don't want to feel that my friends can't go where I am. We want to talk together and consult together, and I would like to see this antagonism done away with.

Pres. Abbott—I don't know whether it would be in order for me to make a speech that I have been wanting to make in regard to supply dealers. A supply dealer has a right to be, and if he has a right to be, he has a right to be at the convention. If he has a right to exist,

he has a right to be at the convention. There are a great many people who think they have said the thing when they say, "I want to get rid of the middle-men." That word moves glibly off of their tongue. They have the idea that no one is a producer except the man who takes out his big knife and whittles a stick in some shape. The man who takes a stick and turns out a rolling-pin is a producer, and any man who has anything to do with that rolling-pin until it reaches the consumer, is a producer also. Here is a man who produces rolling-pins. He lives in Canada. I want a rolling-pin, and I live in St. Joseph, Mo. He might produce thousands and thousands of them, but they would do me no good. I could not afford to pay my fare and go up there and buy one, and the result necessarily would be that I would never get a rolling-pin. Do you see the point?

I claim that every one is a producer who gratifies a desire; who furnishes to the man who has the desire the thing he wants at the time he wants it, and in the quantity he wants it; and a man who takes rolling-pins under his arm and carries them down to St. Joseph and lays them down on this table, and leaves them there until the people's wants are all supplied, is just as much of a producer as the man who turns them out of wood; and it is all a mistake about these people not being producers.

Mr. Holterman—Who is, after all, as much interested in the success of the bee-keeper as any? Not success just for the moment, but permanent success. It is the man who is in the supply business. Isn't he as much interested as any other person in the world? If he is level-headed he will work heart and soul for the success of the bee-keeper and for his interests, and in that way develop the industry.

Mr. Root—When we get acquainted with these people, sometimes we find that they are not so bad after all. We have met a good many people here, and we are going home with a great deal more faith than we had when we left home. There are quite a number of good people in Missouri.

We especially commend the following paper to the attention of the bee-keepers of the State:

HONEY RESOURCES OF THE FUTURE.

By S. E. Miller, Bluffton, Mo.

As land becomes more valuable it is more thoroughly tilled and less of it is allowed to lie idle, and in a number of other ways land that once supported a multitude of nectar-yielding plants and trees, is turned to the production of corn, wheat and other crops that yield lit-

tle, if any, nectar. Every basswood tree that is felled within a certain radius of our apiaries must mean that our bees have access to a certain number of pounds less of nectar than they had while that tree was standing. Every white clover field that is turned under within the same radius means that our bees are curtailed to a certain extent.

Considering this, what will be our resources in the future? What is to take the place of the flora that has been so bountifully disseminated by a loving Creator, when that flora has fallen before the hand of civilization? True, we might pack up our bees and move to a new and unoccupied fiele, but even this cannot last always. The sage-bush of the wild West is being rooted up to give place to orchards and vineyards. Even if it were always practical to secure good pasturage by frequently moving, this course is not suited to the taste of a bee-keeper, for if I mistake not he is one who loves to have a home, and loves that home more than any other spot on earth. What then can we grow to take the place of these native plants, so that we may be reasonably sure of having something from which our bees can gather nectar in sufficient quantities to give us a crop of honey that will pay for our time, labor and money expended, and leave us at least a small profit?

I, for one, believe that we cannot urge too forcibly the prudence of taking care of that which we have. Often land that is too uneven to admit of cultivation may be devoted to pastures, and here is where we may spare such trees as bass-wood, maple and others that produce nectar and pollen. No doubt many bee-keepers are owners of tracts of woodland, and when clearing up the land for pasture, if all the nice bass-wood trees are left standing, they will be no hindrance to the grass that grows beneath them, but often a benefit by keeoing the ground cool and moist beneath them, while the ground where no trees are standing will be hot and dry and the grass parched.

The maples, while they do not produce any of the surplus honey, contribute in an indirect way toward it, as they produce an abundance of pollen and (according to my observations) some nectar just at a time when most needed. These two then should be spared whenever practical; for, if we speak of the sugar maple alone, it is a producer of another sweet that, in the opinion or on the palate of many, surpasses even honey, and in this way may be an additional source of revenue to the owner of the land; besides, both themaple and bass-wood are elegant and noble shade-trees. What I have said about these two applies to my own part of the country. To what trees the above suggestions will apply in other parts of the country, each one must know for himself. Before leaving this point I might add that those bee-

keepers living in or near a town would do well to exert themselves in inducing the towns-people to plant bass-wood trees in preference to other kinds, and I believe one could well afford to furnish the trees at his own expense if he intends to continue in the bee business for a number of years.

I cannot leave the subject without speaking of the clovers, for upon this class of plants a vast number—perhaps a great majority—of the bee-keepers of the United States must depend for their surplus, and as time passes we must each year become more dependent upon these. Clover is a crop that should be grown upon every farm in the land that is adapted to it. I venture the assertion that 90 per cent of the farms that are adapted to it would be highly benefited by a thorough rotation of clover, corn, wheat and the other farm crops. What kind of clover, then, shall we grow? Of the alfalfa it is not necessary for one to speak, for it has already proven itself to stand in the front rank among the honey-producing plants of our country. In that part of the country to which it is adapted, no doubt it stands at the head among cultivated crops, and the bee-keeper can hardly hope to find a crop that is profitable, aside from the nectar it yields, which will furnish a greater amount of valuable pasturage for his bees.

But in the majority of states to which alfalfa seems to be ill adapted, we must look for another plant in which we can induce the farmers to become interested. This we have in alsike clover. This clover seems well suited to all lands where the common red clover thrives, and is at present about as profitable a crop, and in some cases even more profitable. My own experience is that it does not make as much hay per acre as the red does, but it is of enough finer quality to make up for the difference in bulk. Here it seems to stand drouth and pasturing better than red clover; holds its own against weeds, and will stand and produce good crops for a year or two longer than red clover. It produces about as much seed per acre, and the seed is always higher per bushel than that of red clover.

In this, then, we have a profitable farm crop, that is well suited to a large portion of the country. As to the amount of nectar it will yield, no one can more than conjecture; but from what observations I have taken, I would place it ahead of the native white clover, taken acre for acre.

I have only mentioned the name of red clover, so far, and need scarcely say more. That it often furnishes an abundance of nectar we are all aware, but that the bees can seldom procure it we are also aware, notwithstanding the claims that some make that their bees can get the nectar from red clover. Bees do certainly work on it at times,

but I think seldom is enough gotten to amount to a surplus. Honey from alfalfa clover can now be purchased by the ton. How soon the same may be said of alsike clover honey no one knows. But it is quite evident that the honey of the future will be gathered mainly from some one of the many species of clover—the king of the honey-producing plants.

The ideas suggested in the above paper are of importance to every farmer in the State, even though he may never own a colony of bees. Modern investigation has established a few things beyond successful contradicion. One of them is that there are much better forage plants than our common timothy—better as rations for stock and better in every way for the soil on which they are grown. The writer has before him a bulletin issued by the Department of Agriculture, in which it is said, "Why should the farmer go on raising meadow hay as his main support of coarse fodder, and buying grain to supplement it, when by growing leguminuos crops, the nitrogen required by animals can be produced at the lowest cost? The crops of red clover, crimson clover, Japan clover *(Lespedeza)*, cow-pea, alfalfa, soja bean, horse-bean, serradella, and many others of this class, far surpass common hay in the food materials they contain, both pound for pound, and in yield per acre. They may be grown as catch crops, and used for soiling or pasturage, or they may be grown for making hay or silage." * * * "It may be said in general, that 100 pounds of hay from leguminous crops contain about twice as much protein as 100 pounds of hay from grasses. The leguminous hay may be safely estimated as worth from one-fourth to one-third more for feeding than common hay."

As to the fertility which these plants add to the soil, it is said: "Green manuring with clovers, peas, beans, lupines, etc. (leguminous crops), actually enriches the soil in nitrogen drawn from the air. These plants can grow with very little soil nitrogen. They store up the nitrogen of the air as they grow, and when plowed under, give it up to the soil and to future crops. It is the cheapest means of manuring the soil with nitrogen."

Now, if the above statements are true, and science tells us that they are, then it only becomes a question of which one of these leguminous plants is best suited to the climate and to the soil of the farm as a fertilizer, and at the same time will produce a good forage crop. Alsike clover is without a doubt an excellent forage plant, but it is not as good a soil fertilizer as red clover, according to the best authorities; but if the farmer is a bee-keeper, the fact that it is a first-

class honey producer will no doubt lead him to select it in preference to red clover. There are, however, some plants mentioned in the quotationabove, which are superior to either of these as forage plants, and also for green manure, and the writer knows at least one of them to be a very fine honey plant. This is alfalfa. Secretary Coburn has lately issued a very important report on this plant, and a careful analysis of the conditions under which it is now being successfully grown in the State of Kansas has convinced me, that it will adapt itself to a much greater variety of soil and climate than has been generally supposed. There is a large part of Missouri in which I think alfalfa can be grown to the great benefit of the land, and with large profit to the farmer. From what I learn from a careful study of the above report, and from other sources, I do not think there can be any doubt of this. In fact, a gentleman who lives in Northwest Missouri said on the floor of the convention, that he was now successfully growing it on his farm, and he spoke in the highest praise of it as a food for stock, and as a honey plant. I wish to urge upon the farmers of the State, and especially those who keep bees, the importance of testing the merits of alfalfa at an early hour.

The following letter written to Mr. M. M. Baldridge of Illinois, by a gentleman in Hamilton county, Nebraska, with Mr. B.'s reply, will throw further light on the subject of alsike clover. I offer no excuse for introducing it here, as the subject is one of vital importance to all the farmers of the State.

DOES ALSIKE CLOVER PAY?

Mr. Baldridge—I have now grown alsike clover about six years. At present I have about 80 acres of it, but I expect to plow it up the coming spring. The dry weather of the past year has just about used it up. I cut the past season some 70 acres of alsike for seed, but the drouth was so severe upon it that I got only 55 bushels. One year I cut 63 acres of alsike for seed, and got on an average four bushels per acre. I shipped the seed to Chicago, and it netted me $8.15 per bushel. Last fall I plowed up 80 acres of alsike and seeded the land to wheat. The land, owing to drouth and too close pasturing, had become weedy. I have now 110 acres of alsike mixed with timothy. Some of this I intend to cut for hay, and use the rest of the land for pasture. Alsike does well on land too wet for red clover. With me it seems to seed best in moderately dry seasons.

I have sown alsike on timothy sod, also on wild-grass sod, and with grand success. With plenty of moisture the seed will catch and grow on almost any kind of land already seeded down to grass. I

have never seeded land with alsike in the fall; but if sown with rye or wheat, and early, I see no reason why it should not winter all right. When sown early in spring, on rye or wheat, it makes a good catch and is a success.

I keep a few bees. Alsike makes a good bee-pasturage, and the honey therefrom can hardly be surpassed in quality.

The bee-keeping fraternity wants all the facts about alsike it can get. Owing to the rapid destruction of basswood, we desire to supply its loss with something that will be at least its equivalent. It is my belief that alsike clover is the very thing we want, and is a profitable substitute for basswood. I have kept bees for many years where basswood abounds, and have had more or less experience with alsike, and I have concluded that I should much prefer to depend on alsike for honey. One thing is certain, the honey from alsike is superior to that from basswood, and gives far better satisfaction, as a table sauce, to consumers generally. At least, that has been my experience.

The reader will please notice in the letter from Nebraska, that sod land of any description, will do to sow alsike seed upon. This is a fact very important to know. It is by no means a new fact to the writer, nor to several others in this vicinity; but it may be new to the multitude. The present winter is just the time to scatter alsike seed upon sod land. The melting of the winter snows and the early spring rains will be certain to cause nearly every seed to germinate and grow. Try a few acres, at least, and note the results. Utilize the roadsides and the waste places everywhere, and especially the unused land of railroads. If you own no land, try to induce some of the farmers whose land is within short range of your bees to give this plan of getting a start with alsike a trial. You can afford to make your farming friends a present of enough seed to keep every bee you own at work while the alsike is in bloom. But it is not necessary to do this, nor is it policy to do just that way. The better way is to supply them with seed at your own expense, and then have them repay you as soon as they ascertain the fact that they can afford to do so. This plan does not excite suspicion that you alone have an "ax to grind," and that you are on the hunt for some one to furnish the grindstone.

On sod ground or where mixed with timothy seed, two pounds of alsike seed is plenty for one acre. Four pounds of alsike is plenty for one acre when sown alone.

There is another plant which I deem of sufficient importance to merit the attention of bee-keepers. I refer to what is known as sweet clover. This plant is especially suited to sowing in waste places, such as rocky side-hills, where nothing else will grow. I know some look

upon it as a weed, but stock may be taught to eat it greedily; and as it belongs among the leguminous plants, the same as clover, it is a good soil enricher. The following remarks by A. I. Root may be very fittingly introduced just here:

"During my visit at Salt Lake City I wrote up at length in regard to the beautiful honey gathered from sweet clover that thrives so luxuriantly out on the sandy alkali plains, where no other plant could flourish on account of alkali. This honey is not only equal to any other produced in the world, but it is about the whitest and finest-looking honey in the world. The only respect in which it is inferior to the white sage honey of California is that the sweet clover honey candies readily on the approach of cold weather, but the sage honey does not; and when candied it is, perhaps, the whitest candied honey gathered from any known source. Well, just now I am greatly pained to find that some of the food commissioners think, without analyzing, this honey of Salt Lake City is sugared, probably because of its extra fine appearance. In fact, some specimens of candied honey are almost as white as snow, or as white as white sugar. One who is at all conversant with the plant—sweet clover—will have no difficulty at all in recognizing sweet-clover honey. It has a faint or very delicate flavor, reminding one of the smell of sweet clover while in bloom. If you bruise the foliage of the sweet clover when the plant is growing rank in the spring, you will also get a strong perfume, quite like the delicate flavor of the honey. Sweet-clover honey ought to be as readily identified as basswood and clover; and it is a burning shame that the friends who are producing and marketing this beautiful product should be persecuted, by having some stupid official pronounce it, or even suggest that it is not pure honey.

WHAT THE BEE-KEEPER DOES FOR THE COUNTRY.

By R. F. Holtermann, editor of the Canadian Bee Journal.

The great problem during agricultural depression has been, how shall we make our farms more productive? This question has several aspects, but the side of particular interest is, how can we produce the most dollars and cents with the least capital, and take the least from the soil? An analysis by Prof. Robertson shows how greatly the fertility of the soil is reduced in point of plant food by all farm produce. Again, the capital required is an important item, important because the interest on capital must be allowed for, and upon the amount of capital depends the amount of minor expenses, such as taxes, wear and tear of buildings, insurance. This must be deducted to get at the true

profit. If you have one hundred head of dairy cows, they practically displace some other crop upon the farm, or they prevent the selling of some other crop from the farm, which to some extent is the same thing. Or, where you have wheat, you cannot grow an oat crop at the same time, and so on. But the bee-keeper increases the wealth-producing powers of the country. One hundred hives can be put in a very small compass, and, aside from the room they stand on, the farm can be made to produce just as much as before, the bees availing themselves of the natural flowers in the vicinity. More than that, the bees assist the clover-seed and fruit-grower, and, therefore, increase the wealth-producing powers of the country, apart from the honey gathered, to that extent. But some one will say, how much does the honey crop draw in the way of plant food? Here, again, bee-keeping makes the best showing. The honey is made up entirely of constituents supplied by the atmosphere, and draws nothing from the soil. One hundred hives, in a good locality, and under skillful management, will, one season and another, produce as much as the average hundred acres. One hundred colonies of bees, with necessary appliances, are worth, say $800. How much is the farm and stock worth?

It may be argued that men fail in bee-keeping. So they do, but men fail in everything; and to succeed in this, one must exercise thought, have experience, or acquire it slowly by a gradual increase in the number of colonies kept, and not only have one's own experience, but try to learn from the experience of others, which is most readily done through the press. In the past there has been too much an idea that all that is required to be done is to get the bees and take the honey. As far as the above goes, whatever is worth undertaking by an intelligent and diligent person has set upon it a premium which prevents everyone from succeeding in it, and bee-keeping in this respect is the same as many other undertakings.

Do not let it be understood that I disparage dairying. I am a strong advocate of dairying, but I am giving some of the benefits the country derives from keeping bees.

The bees are benefactors to everyone who eats honey. Honey is nectar gathered from flowers. This nectar is a pure saccharine substance with certain essential oils in it. The bees, in the slow process of gathering the nectar, as they pass from flower to flower, add to it secretions from the head-glands, making it undergo the first stages toward digestion. The nectar is spread in cells in the comb, and a current of warm air is passed over them. This current is charged with formic acid by the bees, which enables the honey to ripen without fermentation.

The honey when ripe gives us a most wholesome food, unless sweets of all kinds are injurious. For children it is a delicious food. For the adult it is equally beneficial. Our house is never without honey, and it is a staple article upon our table. During the prevalence of la grippe, our house suffered not from its ravages, and I have heard the same from many who constantly use honey.

DEDUCTIONS FROM SECRETARY COBURN'S REPORT ON ALFALFA.

By Emerson T. Abbott.

I find that the report represents in the State of Kansas about 152 farmers who have, as per their statement, about 7000 acres of alfalfa; of this, 1150 belongs to one man and 700 to another. A few of those who reported did not mention the number of acres, so that the above is only an estimate. Of course the report does not make any pretensions to covering the entire yield of the State, and the natural conclusion would be that it represents only a very small part of the present acreage of this valuable plant.

I was interested to know the kind of soil on which the plant is grown, and so went through the reports carefully, with the following results: One hundred and twenty-five report their crop on "bottom" or "second bottom," and the soil mostly rich loam. Twenty-five report the crop grown on upland, and the soil loam and clay. Sixty-six report the sub-soil clay or hard-pan; most of this number say "hard-clay." A few report sand and clay, and a few sand only; 32 report the sub-soil "gumbo."

Forty-two reported water at 10 feet and less; 38 over 10 and less than 20 feet; five over 100 feet; ten over 50 feet and less than 100 feet; 57 of them range from 20 to 40 feet.

The highest profit given per acre is $60 and the lowest $8. Several give $50 per acre, but the most of them range from $16 to $27. One man reports 16 acres of upland, "stiff clay loam" and "hard clay soil," 200 feet to water and a profit of $21 per acre.

It will be seen from studying the report carefully, that while alfalfa gives the best returns on bottom land where water is reached within 20 feet, yet it will grow on a variety of soils, and can be made a profitable crop where it is at least 100 feet to water. Many people have an idea, and the writer was among the number until lately, that alfalfa will not grow profitably where there is a clay sub-soil; but it will be noticed that 66 report that kind of sub-soil.

While I may have made mistakes in some of my calculations, yet I think the above figures will give a pretty clear idea of the conditions

under which alfalfa is being grown in Kansas at the present time. With these facts before me, I am inclined to think that this wonderful leguminous plant will adapt itself to a much larger variety of conditions than has been generally supposed.

While I did not make a record of those who irrigated their crop, yet the fact was noticed that most of those who reported had no means of irrigating the land. One man says: "The hot winds have never been able to make it drop a leaf during those two years of almost continuous dry weather."

In giving this report to the farmers of Kansas, Secretary Coburn has conferred a more lasting benefit on them than many of them realize.

The word alfalfa literally means "good fodder," and whoever studies this report carefully will be thoroughly convinced that it has not been wrongly named.

AGRICULTURAL SOCIETIES.

Section 4058, Revised Statutes, requires agricultural societies to annually report to the State Board of Agriculture the number of members, the financial condition of their society, and quality character of property owned, the quality and cost of improvements, the number and value of premiums awarded at their annual fair, the number and character of animals and articles exhibited, etc., etc.

Section 4059, Revised Statutes, requires State Board of Agriculture to compile and faithfully report all facts and statistics collected from the agricultural societies to the General Assembly.

Each year a compliance with this section of the law is attempted on the part of the State Board of Agriculture. Blanks are prepared and sent to each society in the State, but we regret to say that the responses are not as prompt and frequent as we might expect.

If it is important that these statistics be compiled and published, some penalty should attach for non-compliance with section 4058 on the part of the agricultural societies.

We are impressed with the opinion that these reports should be made much more complete than was even contemplated by the present law; that the State should be more directly connected with these societies, should aid in protecting their solvency, should look after the interest of stockholders and see that exhibitors are secured in awards made them by providing that they shall have first lien on gate and other receipts of the association, by stringent laws to prevent the entering of animals or articles out of their class; declare the ringing of horses a felony, punishable by imprisonment, carefully guard the interests, and liberally encourage Missouri breeders and exhibitors, and provide for publication of what we are doing, what we have, and the steps we are taking for the advancement of our agricultural and live-stock interests.

The present law providing for the collection of these statistics, without means of enforcing a compliance, is practically inoperative, is

unsatisfactory, and when published in annual report, on account of its incompleteness, does a grave injustice to the agricultural interests of the State.

We would advise that the law be amended so as to provide for collection of full and complete reports, or that it be repealed and the work discontinued.

Work half way done is wore than worthless, and it cannot be done satisfactorily unless proper and efficient means are provided.

ADAIR COUNTY.

Report of the Atchison County A. & M. Association, held at Rockport on the 11th-14th September, 1894, as required by section 333 of the Missouri Statutes:

Number of members	86	
Indebtedness	$1750	
ASSETS.		
Land, number of acres 55. Value		$5500
Buildings—		
Grand-stand		800
Art hall		1000
Stables		1800
Other improvements		1200
General condition of property, first-class.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered all ages, number		18
Best time, aged horses		2 : 26
Pacers—Total entered all ages		8
Best time, aged horses		2 : 30
Runners—Total entered all ages		12
Best time, 1 mile		1 : 54
Best time, ½ mile		: 51
Live-stock—		
Horses, all kinds		45
Cattle, all kinds		22
Hogs, all breeds		96
Sheep, mutton breeds		10
Poultry, all kinds		65
Farm and garden products, number of entries		395
Implements		27
Ladies' department		465
Miscellaneous		32
Total number of entries		1195
Total number of premiums paid		865
Total amount of premiums paid	$1675 10	
Expenses other than for premiums	887 75	
Total receipts	2574 55	

J. W. YOUNG, Secretary, Rockport. MILES SICKLER, President.

AUDRAIN COUNTY.

Report of the Mexico Driving Park Association, held at Mexico on the 28th day of August to September 1, 1894, as required by section 333 of the Missouri Statutes:

Number of members	10	
Indebtedness	$8000	
ASSETS.		
Land, number of acres 80. Value		$12,000
Buildings—		
Grand-stand		4,000
Art hall		1,200
Stables		3,000
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total all ages, number		48
Best time, aged horses		2 : 49½
Best time, 3 years old		2 : 34½
Best time, 2 years old		2 : 37½
Pacers—Total entered all ages		27
Best time, aged horse		2 : 17½
Best time, 3 years old		2 : 40½
Live-stock—		
Roadster horses		75
Saddle horses		85
Total number of entries		235
Total number of premiums paid		58
Total amount of premiums paid	$5050	
Expenses other than for premiums	300	
Total receipts	6325	

C. F. CLARK, Secretary, Mexico. W. J. BOTTS, President.

BATES COUNTY.

Report of the Rich Hill Fair Association, held at Rich Hill on the 21st-24th August, 1894, as required by section 333 of the Missouri Statutes:

Number of members	152	
Indebtedness	$1200 00	
ASSETS.		
Land, number of acres, 40. Value		$2000
Buildings—		
Grand-stand		800
Art hall		500
Stables		1200
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered all ages, number		78
Best time, aged horses		2 : 22
Best time, 3 years old		2 : 29½
Best time, 2 years old, ½ mile		1 : 16½
Best time, 1 year old, ½ mile		1 : 18¾
Pacers—Total entered all ages		33
Best time, aged horses		2 : 16
Best time, 1 year old, ½ mile		1 : 18¾
Runners—Total entered all ages		13
Best time, ¾ mile		1 : 22
Best time, ½ mile		: 51¾
Live-stock—		
Draft horses, number		49
Coach horses		17
Roadster horses		36
Saddle horses		39
Hogs, all breeds		12
Sheep, wool breeds		5
Poultry, large breeds		47
Farm and garden products, number of entries		385
Ladies' department		756
Miscellaneous		138
Total number of entries		1484
Total amount of premiums	$4066 30	
Expenses other than for premiums	2615 44	
Total expenditures	6681 74	

W. T. MARSH, Secretary, Rich Hill. W. G. BEASLEY, President.

CASS COUNTY.

Report of the Belton Association, held at Belton on the 21st-25th August, 1894, as required by section 333 of the Missouri Statutes:

Indebtedness	$1800
ASSETS.	
Land, number of acres, 34. Value	$3400
Buildings, grand stand	1000
Art hall	300
Other than above	1600
Other improvements	100
General condition of property, good.	
EXHIBITS.	
Speed rings—	
Trotters—Total entered all ages, number	59
Best time—aged horses	2:30
Pacers—Total entered, all ages	24
Best time—3 years old	2:28
Runners—Total entered, all ages	25
Live-stock—	
Draft horses, number	5
Roadster horses	39
Saddle horses	24
Cattle, beef breeds	10
Dairy breeds	16
Hogs, all breeds	19
Sheep, mutton breeds	9

F. G. ROBINSON, Secretary.

CALDWELL COUNTY.

Report of the Hamilton Fair Association, held at Hamilton on the 28th-31st August, 1894, as required by section 333 of the Missouri Statutes:

Number of members	13	
Indebtedness (none).		
ASSETS.		
Land, number of acres		40
Buildings—		
Grand stand		1
Art hall		1
Exposition		1
Horse stalls		105
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages, number		20
Best time, aged horses		2 : 29¼
Best time, 2 years old		2 : 58½
Best time, 1 year old, ½ mile		1 : 45
Pacers—Best time, aged horses		2 : 25
Live-stock—		
Draft horses		149
Coach horses		
Roadster horses		
Saddle horses		
Cattle, beef breeds		36
Hogs, all breeds		67
Sheep, mutton breeds		42
Poultry, large breeds		20
Farm and garden products, number of entries		335
Implements		25
Ladies' department		360
Miscellaneous		23
Total number of entries		1067
Total amount of premiums paid	$1100	
Expenses other than for premiums	2000	
Total receipts	3460	

ROBT. W. COX, Secretary, Hamilton. R. W. Napier, President.

CALLAWAY COUNTY.

Report of the Callaway County A. and M. Association, held at Fulton, on the 11th-14th day of September, 1894, as required by section 333 of the Missouri Statutes:

Number of members	115	
Indebtedness	$3,500 00	
ASSETS.		
Land, number of acres, 40. Value		$4000
Buildings—		
Grand stand		4000
Art hall		1000
Stables		500
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages, number		19
Best time—aged horses		2 : 30
Pacers—Total entered, all ages		8
Best time, aged horses		2 : 35
Runners—Total entered, all ages		13
Best time, 1 mile		1 : 50
Live-stock—		
Draft horses, number		5
Roadster horses		43
Saddle horses		49
Cattle, dairy breeds		20
Hogs, all breeds		23
Sheep, mutton breeds		16
Poultry, large breeds		30
Farm and garden products, number of entries		53
Ladies' department		105
Total receipts	$2800	

E. L. EDWARDS, Secretary, Fulton. W. H. VIVION, President.

CARROLL COUNTY.

Report of the Carroll County Fair Association, held at Carrollton on the 28th day of August, 1894, as required by section 333 of the Missouri Statutes:

Number of members	10	
Indebtedness (none).		
ASSETS.		
Land, number of acres, 40. Value		$5,000
Buildings—		
Grand stand		1200
Art hall		1100
Stables		1500
Other improvements		1200
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages, number		22
Best time, aged horses		2 : 24
Best time, 2 years old		3 : 10
Best time, 1 year old		3 : 20
Pacers—Total entered, all ages, number		12
Best time, aged horses		2 : 24½
Best time, 2 years old		3 : 00
Best time, 1 year old, ½ mile		1 : 39½
Runners—Total entered, all ages, number		19
Best time, 1 mile		1 : 49
Live stock—		
Draft horses, number		11
Roadster horses		20
Saddle horses		6
Poultry—Large breeds		40
Egg producers		25
Farm and garden products, number of entries		54
Ladies' department		105
Miscellaneous		75
Total number of entries		350
Total number of premiums paid	78	
Expenses other than for premiums	$300	
Total receipts	3,300	

FRED. J. WHITE, President.

J. N. TULEY, Assistant Secretary. Carrollton.

CLARK COUNTY.

Report of the Clark County A. and M. Association, held at Kahoka, on the 29th day of August to September 1, 1894, as required by section 333 of the Missouri Statutes:

Number of members	140	
Indebtedness	$1200	
ASSETS.		
Land, number of acres, 30. Value		$2000
Buildings—		
Grand stand		1200
Art hall		1200
Stables		1500
Other improvements, fencing, etc		500
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages, number		60
Best time, aged horses		2:29
Best time, 3 years old		2:49
Best time, 2 years old		3:08
Pacers—Total entered, all ages		10
Best time, aged horses		2:31
Live stock—		
Horses—Draft, number		31
Coach		12
Roadster		30
Saddle		16
Cattle—Beef breeds		38
Dairy breeds		21
Hogs—All breeds		45
Sheep—Mutton breeds		40
Poultry—Large breeds		24
Farm and garden products, number of entries		150
Implements		20
Ladies' department		1100
Amount of premiums paid	$1602 59	
Expenses other than for premiums	1123 80	
Total receipts	2497 95	

JOSEPH VANDOLAH, Secretary, Kahoka. W. M. BOULWARE, President.

CLINTON COUNTY.

Report of the Cameron Agricultural Association, held at Cameron on the 21st-24th August, 1894, as required by section 333 of the Missouri Statutes:

Number of members	7
Indebtedness, none.	
ASSETS.	
Land, number of acres 40. Value	$2400
Buildings—	
Grand-stand	1700
Art hall	2000
Stables	5000
Other than above	200
Other improvements	500
Goneral condition of property, nearly new and in good order.	
EXHIBITS.	
Speed rings—	
Trotters—Total entered all ages, number	45
Best time, aged horses	2 : 30
Pacers—Total entered all ages	20
Best time, aged horses	2 : 13½
Runners—Total entered all ages	30
Best time, ½ mile	50½
Live-stock—	
Horses—Draft, number	50
Coach	20
Roadster	50
Saddle	10
Cattle—Beef breeds	22
Dairy breeds	57
Hogs—All breeds	50
Sheep—Mutton breeds	10
Wool breeds	20
Poultry—Large breeds	50
Egg producers	12
Farm and garden products, number of entries	75
Implements	2
Ladies' department	100
Miscellaneous	50
Total number of entries	800
Total number of premiums paid	300
Total amount of premiums paid	$2500
Expenses other than for premiums	2000
Total receipts	4200

R. STURGEON, Secretary.

GASCONADE COUNTY.

Report of the Gasconade County Agricultural Association, held at Hermann on the 30th day of August to September 1, 1894, as required by section 333 of the Missouri Statutes:

Number of members	81	
Indebtedness, none.		
ASSETS.		
Land, number of acres 6.11. Value		$2500
Buildings—		
Rotunda		500
Poultry-house		150
Two exposition		500
Stables		100
Other than above		200
Other improvements		200
Other property		50
General condition of property, good.		
EXHIBITS.		
Live-stock—		
Draft horses, number		3
Coach horses		10
Cattle—Dairy breeds		10
Hogs—All breeds		11
Poultry—Large breeds		11
Egg producers		15
Farm and garden products, number of entries		204
Implements, displays		2
Wine		46
Ladies' department		144
Miscellaneous		111
Fruits and grapes		155
Total number of entries		752
Total number of premiums paid		190
Total amount of premiums paid	$421 50	
Expenses other than for premiums	373 35	
Total receipts	870 75	

WM. C. BOEING, Secretary, Hermann. HUGO KROPT, President.

GRUNDY COUNTY.

Report of the N. M. C. A and I. Association, held at Trenton on the 11th day of September, four days, 1884, as required by section 333 of the Missouri Statutes:

Number of members	56	
Indebtedness	$2000	
ASSETS.		
Land, number of acres 23. Value		$4000
Buildings—		
Grand-stand		300
Art hall		500
Stables		500
Other than above		1200
General condition of property, fairly good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered all ages, number		8
Best time, aged horses		2 : 19
Pacers—Total entered all ages		12
Best time aged horses		2 : 29½
Runners—Total entered all ages		33
Best time, 1 mile		1 : 47½
Best time, ½ mile		: 50
Live-stock—		
Horses—Draft, number		21
Roadster		45
Saddle		10
Cattle—Beef breeds		49
Dairy breeds		16
Hogs—All breeds		49
Sheep—All breeds		29
Poultry—All breeds		51
Farm and garden products, number of entries		110
Implements		20
Ladies' department		517
Total number of entries		970
Total number premiums paid		218
Total amount of premiums paid	$1808 45	
Expenses other than for premiums	620 08	
Total receipts	2335 60	

PETER H YAKEY, Secretary, Trenton. G. W. SMITH, President.

HARRISON COUNTY.

Report of the Ridgeway Fair Association, held at Ridgeway on the 8th day of October, 1894, as required by section 333 of the Missouri Statutes:

Number of members	5	
Indebtedness	$1000	
ASSETS.		
Land, number of acres, 40. Value		$1200
Buildings—		
Grand stand		50
Art hall		150
Stables		100
Other than above		100
Other improvements		100
General condition of property, fair.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages, number		7
Best time, aged horses		2:50
Best time, 2 years old		2:55
Runners—Total entered, all ages, number		18
Live-stock—		
Horses—Draft, number		6
Coach		4
Roadster		6
Saddle		2
Cattle—Beef breeds		6
Hogs—All breeds		23
Sheep—Mutton breeds		12
Poultry—Large breeds		32
Farm and garden products, number of entries		34
Implements		2
Ladies' department		72
Miscellaneous		10
Total number of entries		217
Total number of premiums paid		153
Expenses other than for premiums	$209	
Total receipts	627	

GEO. T. KIRK, Secretary.

HENRY COUNTY.

Report of the Henry County Fair Association, held at Clinton on the 1st day of August, 1894, as required by section 333 of the Missouri Statutes:

Number of members (none)		
Indebtedness (none)		
Total premiums paid	$2678 50	
Expenses other than for premiums	1160 48	
Total recipts	3662 75	

THOS. DAYS, Secretary, Lewis Station. GEO. Y. SALMON, President.

JEFFERSON COUNTY.

Report of Jefferson County Fair Association, held at DeSoto on the 18th-21st day of September, 1894, as required by section 333 of the Missouri Statutes:

EXHIBITS.	
Speed rings—	
Trotters—Total entered all ages, number	10
Pacers—Total entered all ages	8
Runners—Total entered, all ages	27
Live-stock—	
Horses—Draft, number	36
Coach and roadster	28
Saddle	9
Cattle—Beef breeds	27
Dairy breeds	20
Hogs—All breeds	47
Sheep—Mutton breeds	1
Wool breeds	13
Poultry—All breeds	14
Farm and garden products, number of entries	136
Implements	6
Ladies' department	133
Miscellaneous	20
Total number of entries	488
All premiums were paid 50 per cent.	
Total amount of premiums paid	$560 50

J. M. BURKS, Secretary, DeSoto. GUST. HUND, President.

JOHNSON COUNTY.

Report of the Johnson County A. & M. Fair Association, held at Holden on the 28th day of August, 1894, as required by section 333 of the Missouri Statutes:

Indebtedness	$2250	
ASSETS.		
Land, number of acres, 40. Value		$3500
Buildings—		
Grand stand		1000
Art Hall		1200
Stables		2000
Other improvements		100
Other property		125
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages, number		6
Best time, aged horses		2 : 21¼
Pacers—Total entered, all ages, number		14
Best time, aged horses		2 : 25½
Runners—Total entered, all ages, number		36
Best time, ½ mile		50½
Live-stock—		
Horses—Draft, number		14
Roadsters		64
Saddle		23
Hogs—All breeds		66
Sheep—Wool breeds		11
Poultry—Large breeds, Egg producers		177
Farm and garden products, number of entries		200
Ladies' department		135
Miscellaneous		38
Total amount of premiums paid	$1710 30	
Expenses other than for premiums	948 70	
Total receipts	2739 16	

J. V. MURRAY, Secretary, Holden. WM STEELE, President.

KNOX COUNTY.

Report of the Knox County Fair Association, held at Edina on the 18th day of September, 1894, as required by section 333 of the Missouri Statutes:

Number of members		11
Indebtedness, none.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered all ages, number		13
Best time, aged horses		2 : 30
Pacers—Total entered all ages		5
Best time, aged horses		2 : 23½
Runners—Total entered all ages		32
Best time, 1 mile		1 : 50
Best time, ¾ mile		1 : 19¾
Best time, ½ mile		: 52
Live-stock—		
Horses—Draft, number		17
Roadster		21
Saddle		22
Farm and garden products, number of entries		85
Ladies' department		183
Miscellaneous		13
Total number of entries		391
Total number of premiums paid		714
Total amount of premiums paid	$1266 04	
Expenses other than for premiums	634 80	
Total receipts	2287 00	

LIVINGSTON COUNTY.

Report of the North Missouri Agricultural and Mechanical Association, held at Chillicothe on the 21st-24th day of August, 1894, as required by section 333 of the Missouri Statutes:

Number of members	135	
Indebtedness, about	$900	
ASSETS.		
Land, number acres, 72. Value		$5000
Buildings—		
Grand-stand, 1		3000
Art hall, 1		400
Stables, 130		1500
Other than above		3000
General condition of property, first-class.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages, number		31
Best time, aged horses		2:24
Best time, 1 year old, ½ mile		1:25
Pacers—Total entered, all ages		6
Best time, aged horses		2:17
Runners—Total entered, all ages		30
Best time, 1 mile		1:52
Best time, ½ mile		:51
Live-stock—		
Horses—Draft, number		20
Coach		7
Roadster		32
Saddle		8
Cattle—Beef breeds		40
Dairy breeds		17
Hogs—All breeds		57
Sheep—Mutton breeds		28
Wool breeds		23
Poultry—Large breeds		21
Egg producers		19
Farm and garden products, number of entries		146
Implements		1
Ladies' department		877
Miscellaneous		159
Total number of entries		1455
Total number of premiums paid		287
Total amount of premiums paid	$2424 90	
Expenses other than for premiums	1216 50	
Total receipts	3657 85	

V. P. SHOVER, Secretary, Chillicothe. J. W. GRAVES, President.

MARION COUNTY.

Report of the Marion County Fair Association, held at Palmyra on the 4th-8th days of September, 1894, as required by section 333 of the Missouri Statutes:

Number of members	150	
Indebtedness	$850	
ASSETS.		
Land, number of acres, 18. Value		$2000
Buildings—		
Grand-stand		2000
Art hall		300
Stables		500
Other than above		500
Other improvements		1000
General condition of property, good.		
EXHIBITS.		
Live-stock—		
Horses—Draft, number		25
Coach		10
Roadster		20
Saddle		10
Cattle— Beef breeds		10
Dairy breeds		20
Hogs—All breeds		30
Sheep—Mutton breeds		20
Wool breeds		10
Poultry—Large breeds		100
Egg producers		50
Farm and garden products, number of entries		200
Implements		2
Ladies' department		500
Miscellaneous		100
Total amount of premiums paid	$2000	
Expenses other than for premiums paid	550	
Total receipts	2550	

R. A. SPENCER, Secretary, Palmyra. J. W. LEMMONS, President.

MONITEAU COUNTY.

Report of the Moniteau County A. and M. Association, held at California on the 18th day of Sept., 1894, as required by section 333 of the Missouri Statutes:

Number of members	120
Indebteness, none.	
ASSETS.	
Land, number of acres 80. Value	$3000
Buildings—	
Grand-stand	500
Art hall	500
Stables	200
Other property	250
General condition of property, good.	
EXHIBITS.	
Live-stock—	
Horses—Draft, number	75
Coach	2
Roadsters	50
Saddle	30
Cattle—Beef breeds	25
Dairy breeds	20
Hogs—All breeds	14
Sheep—Mutton breeds	10
Wool breeds	22
Poultry—Large breeds	15
Egg producers	28
Farm and garden products, number of entries	329
Implements	25
Ladies' department	350
Pantry stores	236
Miscellaneous	100
Total number of entries	1362

T. J. BUCHANAN, Secretary, California. J. A. LANDER, President.

HOLT COUNTY.

Report of Nodaway Valley Fair Association, held at Maitland on the 20th-25th August, 1894, as required by section 333 of the Missouri Statutes:

Number of members (directors)	22	
Indebtedness	$1200	
ASSETS.		
Land, number of acres 37. Value		$2000
Buildings—		
Grand-stand		500
Art hall		600
Stables		800
Other improvements		150
Other property		100
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered all ages, number		15
Best time, aged horses		2 : 19¼
Best time, 3 years old		2 : 46¼
Best time, 2 years old		3 : 09
Pacers—Total entered all ages		8
Best time, aged horses		2 : 24
Runners—Total entered all ages		21
Best time, 1 mile		1 : 49
Best time, ½ mile		: 51½
Live-stock—		
Horses—Draft, number		26
Coach		21
Roadster		32
Saddle		8
Cattle—Beef breeds		25
Dairy breeds		13
Hogs—All breeds		43
Sheep—Mutton breeds		12
Poultry—Large breeds		12
Egg producers		26
Farm and garden products, number of entries		157
Implements		21
Ladies' department		139
Total amount of premiums paid	$1964 35	
Expenses other than for premiums	758 09	
Total receipts	3055 31	

E. S. HART, Secretary, Maitland. D. GELVIN, President.

PLATTE COUNTY.

Report of the Platte County A. & M. Association, held at Platte City on the 28th day of August to 2d September, 1894, as required by section 333 of the Missouri Statutes:

Number of members	100	
Indebtedness	$700	
ASSETS.		
Land, number of acres 32. Value		$4500
Buildings—		
Grand-stand		1500
Art hall		1000
Stables		2000
Other improvements		1000
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered all ages, number		21
Best time, aged horses		2 : 23
Best time, 1 year old, ½ mile		1 : 37
Pacers—Total entered all ages		14
Best time, aged horses		2 : 14½
Runners—Total entered all ages		25
Best time, 1 mile		1 : 50½
Best time, ¾ mile		1 : 23
Best time, ½ mile		: 52½
Live-stock—		
Horses—Draft, number		18
Coach		38
Roadster		13
Saddle		37
Cattle—Beef breeds		3
Dairy breeds		20
Hogs—All breeds		8
Sheep—Wool breeds		4
Poultry—Large breeds		6
Egg producers		7
Farm and garden products, number of entries		251
Ladies' department		306
Miscellaneous		9
Total number of entries		780
Total number of premiums paid		428
Total amount of premiums paid	$2649 75	
Expenses other than for premiums paid	4586 18	

WM. FORMAN, Secretary, Platte City. W. A. ELGIN, President.

RANDOLPH COUNTY.

Report of the Randolph County A. and M. Association, 1894, as required by section 333 of the Missouri Statutes:

Number of members	92	
ASSETS.		
Land, number of acres, 5. Value		$500
Buildings—		
Grand-stand		500
Art hall		200
Stables		330
EXHIBITS.		
Live-stock—		
Horses—Draft, number		29
Coach, Roadster		91
Saddle		41
Mules, jacks and jennets		21
Cattle—Beef breeds		30
Dairy breeds		44
Hogs—All breeds		25
Sheep—All breeds		30
Poultry—Large breeds		31
Farm and garden products, number of entries		80
Ladies' department		272
Miscellaneous		37
Total number of entries		723
Total number of premiums paid		279
Total amount of premiums paid	$425 65	
Expenses other than for premiums	283 20	
Total receipts	700 85	

W. S. COULTER, Secretary. A. CHRISMAN, President.

RAY COUNTY.

Report of the Lawson District Fair, held at Lawson on the 22d-24th days of August, 1894, as required by section 333 of the Missouri Statutes:

Indebtedness	$3000	
ASSETS.		
Land, number of acres, 29. Value		$2900
Buildings—		
Grand-stands, 2		100
Art hall		600
Stables		500
General condition of property, most all in good condition.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages, number		18
Best time—aged horses		2:25
Pacers—Total entered, all ages		12
Best time, aged horses		2:30
Runners—Total entered, all ages		17
Best time, 1 mile		1:50
Best time, ¾ mile		1:21
Best time, ½ mile		:51½
Live-stock—		
Horses—Draft, number		5
Roadster		29
Saddle		21
Sheep—Wool breeds		4
Farm and garden products, number of entries		105
Ladies' department		332
Total number of entries		496
Total number of premiums paid		210
Total amount of premiums paid	$474	
Expenses other than for premiums	2200	
Total receipts	2800	

J. F. ROGERS, Secretary. C. G. RUST, President.

ST. CHARLES COUNTY.

Report of St. Charles County Fair Association, held at St. Charles on the 12th-15th days of September, 1894, as required by section 333 of the Missouri Statutes:

Indebtedness	$4700	
ASSETS.		
Land, number of acres, 41. Value		$9349 00
Buildings—		
Grand-stand		1500 00
Art hall		1500 00
Stables		1500 00
Other than above		1662 35
General condition of property, first-class.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages, number		25
Best time, aged horses		2 : 38½
Best time, 2 years old		3 : 15½
Runners—Total entered, all ages		15
Best time, ½ mile		: 50
Live-stock—		
Horses—Draft, number		15
Coach		15
Roadster		27
Saddle		4
Cattle—Beef breeds		4
Dairy breeds		21
Hogs—All breeds		23
Sheep—Wool breeds		18
Poultry—Egg producers		66
Farm and garden products, number of entries		177
Implements		34
Ladies' department		264
Total number of entries		677
Total number of premiums paid		311
Total amount of premiums paid	$1316 25	
Expenses other than for premiums	1917 40	
Total receipts	3079 90	

ALBERT RUNGE, Secretary, St. Charles.

ST. FRANCOIS COUNTY.

Report of the St. Francois County Fair Association, held at Farmington on the 14th day of Sept., 1894, as required by section 333 of the Missouri Statutes:

Shares, 272; 9 directors.	
Indebtedness	$1200
ASSETS.	
Land, number of acres 20. Value	$2000
General condition of property, bad.	
EXHIBITS.	
Speed rings—	
Trotters—Total entered all ages, number	6
Pacers—Total entered all ages	4
Runners—Total entered all ages	5
Live-stock—	
Horses—Saddle	3
Hogs—All breeds	4
Poultry—Large breeds	7
Farm and garden products, number of entries	42
Ladies' department	114
Miscellaneous	87
Total number of entries	243
Expenses other than for premiums (none paid; rained all time).	
Total receipts	$499 06

J. C. ALEXANDER, Secretary. JAS. HIGHLEY, President.

ST. LOUIS COUNTY.

Report of the St. Louis County Agricultural and Mechanical Association, as required by law:

Total number of said society	225	
Total number of shares of stock subscribed	426	
Total value thereof at $5 per share	$2130	
Amounts paid thereon:		
9 shares full paid	$45 00	
5 shares, 45 cents paid on each	2 25	
74 shares, 25% paid on each	92 50	
335 shares, 5% paid on each	83 75	
3 shares, $3.41⅔ paid on each	10 25	
		$233 75
RECEIPTS.		
Cash in hands of treasurer June 20, 1894	$63 92	
Cash received from all sources and paid to treasurer	1309 50	
Total		1373 42
DISBURSEMENTS.		
For salary and incidentals, 1894	$538 10	
Premiums, fair 1893	4 00	
Payment of note	564 00	
Jacob Studt, lumber	9 50	
Inspectors election	4 00	
Total		1119 60
Cash balance		253 82
LIABILITIES.		
For premiums awarded for fair held in September, A. D. 1894		$646 75
Total value premiums offered		833 00
Total number premiums awarded		355
Total value thereof		646 75
Total number of exhibits		880
Distributed as follows:		
Farm, garden and orchard		263
Cattle		10
Horses and mules		78
Poultry, swine and sheep		63
Agricultural implements made in county		7
Outside of county, diplomas awarded (approximated)		146
Fine arts, textile fabrics and domestic manufacturings		152
Dairy, pantry and household		161

WILL T. SHORES, Secretary. T. D. RAUCHENSTEIN, President.

SCHUYLER COUNTY.

Report of the Schuyler County A. & M. Association, held at Lancaster on the 11th-13th October, 1894, as required by section 333 of the Missouri Statutes:

Number of members	66
ASSETS.	
Land, number of acres 50. Value	$2500
Buildings—	
Grand-stand	400
Art hall	300
Stables	550
Half mile track	1500
Other improvements	50
Other property	75
General condition of property, good.	
EXHIBITS.	
Speed rings—	
Trotters—Total entered all ages, number	10
Best time, aged horses	2 : 27
Pacers—Total entered all ages	3
Best time, aged horses	2 : 27
Runners—Total entered all ages	20
Best time, ½ mile	: 53
Live-stock—	
Horses—Draft, number	3
Roadster	5
Saddle	2
Cattle—Beef breeds	8
Dairy breeds	23
Hogs—All breeds	25
Sheep—Mutton breeds	5
Poultry—Large breeds	15
Farm and garden products, number of entries	50
Ladies' department	70
Total amount of premiums paid	$313 95
Expenses other than for premiums	151 00
Total receipts	483 95

N. T. ROBERTS, Secretary, Lancaster. E. A. DUCKWORTH, President.

SCOTLAND COUNTY.

Report of the Scotland County Fair Association, held at Memphis on the 3d to 7th day of September, 1894, as required by section 333 of the Missouri Statutes:

Number of members	49	
Indebtedness	$2500	
ASSETS.		
Land, number of acres, 40. Value		$3000
Buildings—		
Grand-stand		800
Art hall		300
Exposition		300
Stables		1000
Other improvements		200
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages, number		27
Best time, aged horses		2 : 21
Best time, 3 years old		2 : 30
Pacers—Total entered, all ages		11
Best time, aged horses		2 : 24
Live-stock—		
Horses—Draft, number		35
Roadster		90
Saddle		35
Cattle—Beef breeds		18
Dairy breeds		17
Hogs—All breeds		30
Sheep—Mutton breeds		9
Wool breeds		8
Poultry—Large breeds		28
Egg producers		50
Farm and garden products, number of entries		126
Ladies' department		830
Total number of entries		1320
Total number of premiums paid		320
Total amount of premiums paid	$1430	
Expenses other than for premiums	300	

N. M. PETTINGILL, Secretary, Memphis. J. W. BARNES, President.

STODDARD COUNTY.

Report of the Stoddard County A. & M. Association, held at Dexter on the 18th-22d September, 1894, as required by section 333 of the Missouri Statutes :

Indebtedness	$1000	
ASSETS.		
Land, number of acres, 37. Value		$2500
Buildings—		
Grand-stand		1000
Art hall		700
Stables		1000
Other than above		500
Other improvements		1000
General condition of property, first-class.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages, number		14
Best time, aged horses		2 : 36
Best time, 3 years old		3 : 04
Runners—Total entered, all ages, number		23
Best time, 1 mile		1 : 48
Live-stock—		
Horses—Draft, number		8
Roadster		3
Saddle		3
Cattle— Beef breeds		23
Hogs—All breeds		12
Sheep—Mutton breeds		8
Poultry—Large breeds		14
Farm and garden products, number of entries		125
Ladies' department		514
Total number of entries		759
Total number of premiums paid		903
Total amount of premiums paid	$1796 50	
Expenses other than for premiums	291 15	
Total receipts	2553 70	

I. J. HILL, Secretary.

SULLIVAN COUNTY.

Report of the Sullivan County A. M. and S. G. Association, held at Milan on the 6th-9th day of Oct., 1894, as required by section 333 of the Missouri Statutes:

Number of members	35	
Indebtedness	$1000	
ASSETS.		
Land, number of acres 35. Value		$1750
Buildings—		
Grand-stand		700
Art hall		450
Exposition		250
Stables		800
Other than above		300
Other improvements		250
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered all ages, number		19
Best time, aged horses		2 : 34
Best time, 2 years old		2 : 56½
Pacers—Total entered all ages		10
Best time, aged horses		2 : 35
Runners—Total entered all ages		50
Best time, 1 mile		1 : 45
Best time, ½ mile		: 52
Live-stock—		
Horses—Draft, number		6
Roadster		39
Saddle		3
Cattle—Beef breeds		25
Dairy breeds		1
Hogs—All breeds		23
Sheep—All breeds		36
Poultry—All breeds		81
Farm and garden products, number of entries		83
Implements		10
Ladies' department		413
Miscellaneous		20
Total number of entries		782
Total number of premiums paid		366
Total amount of premiums paid	$1678 75	
Expenses other than for premiums	453 65	
Total receipts	1198 95	

C. B. LANG, Secretary, Milan. JAS. STERLING, President.

SULLIVAN COUNTY.

Report of the N. W. Sullivan County A. & M. Association, held at Harris on the 20th-23d day of August, 1894, as required by section 333 of the Missouri Statutes:

Number of members	9
Indebtedness, none.	
ASSETS.	
Land, number of acres, 40. Value	$1000
Buildings—	
Grand stand	100
Art hall	250
Exposition	250
Other than above	300
General condition of property, good.	

W. H. WATSON, Secretary, Harris. JOHN E. STONE, President.

VETERINARY DEPARTMENT.

The State Sanitary Veterinary Service and its Work.

By T. J. Turner, State Veterinarian.

This department, now about ten years old, has, as do numerous newly established departments, undergone from year to year after its inception several changes, each of which it is hoped is beneficial in bringing it nearer perfection. With this idea, the prevention of the spread of contagious and infectious diseases among domestic animals, and their treatment, paramount, this department was established. For two reasons, such work was at its institution deemed to be necessary: First, that through a proper and thorough, if possible, control of these numerous maladies, great monetary loss could be saved by its citizens; and second, but by far the most important if comparison is to be made, to prevent loss of human life by undue exposure to disease on the part of any human being; also, as near as possible, any contagion from the consumption of unwholesome food, the product of diseased animals.

In order that such might be the case, and the citizens of this great commonwealth might receive the benefit from such work, laws were enacted, and under these the measures set forth as best to effect the ends desired were laid down to be followed by those appointed their custodians. The law, as it today stands upon the statutes, invests the custodianship of the work in the State Board of Agriculture. In order to best accomplish the ends mentioned, this law defines two lines of work to be followed: That which may be defined as field work; and, next, that known as experimental. The field work, being that part which is of most immediate importance to the general public, receives the earliest and most continued effort of the department. Not to go into a detailed review of the law and its requirements, suffice it to say that this branch of the work is largely, and at seasons almost entirely, regulated by the demand made upon it by the citizens of the State, these demands becoming necessary and frequent

in direct ratio to the existence or non-existence of the various maladies. During the year 1894, under this head, there were made from this department in answer to calls by petition, letter, telegram, and in other ways, 105 visits. There were inspected in answer to these calls 268 horses; out of this number 74 were quarantined. Sometimes it became necessary to make more than one call at the same place, and again at times, animals quarantined on suspicion were released. Then again, it was often found unnecessary to quarantine any, as the disease found to exist was not of a dangerous character. To transact the work of this department, 33,175 miles were traveled, and 27 diseases were found to exist.

The total number of animals inspected in answer to call is 515; this includes horse stock, cattle, sheep and hogs. During this year there were $2576.66 paid out for condemned animals under this law, making, as near as can be estimated from the number condemned during the year, about $34.80 per head. In this connection it may be well to mention that often a positive diagnosis is impossible, and that in these cases the test with malleine is employed. This work might be frequently in the line of experimental work; but at this time such confidence has been placed in it that little doubt is entertained as to the existence of glanders, should the test indicate the same.

MALLEINE—WHAT IT IS.

Malleine or glanders lymph.—This is made in general in the following way: Some lymph from a glanderous animal is secured, and this, containing as it does the glanders germ, is placed upon what is termed a potato culture. Upon this culture the germs begin to propagate, and as they do so the cultures become black. By pouring over the culture a liquid of equal parts of water and glycerine, and then placing this liquid, after being poured over the culture, in an apparatus and heating 95 degrees F., it is possible to obtain an extract which, after being several times filtered and sterilized by steam, possesses a characteristic odor, and is of a dark yellow color and oily consistency.

The extract obtained in the foregoing manner is, after it has been treated with a few drops of corrosive sublimate, called malleine. This substance is prepared by the Bureau of Animal Industry at Washington, and is given State departments for such work as comes under their notice. The following are instructions for its use, and some notes following will indicate what is expected, or rather results:

Make the test if possible with a healthy horse, as well as with one or more affected or supposed to be affected with glanders. Take the

temperature of all these animals at least three times a day, for one or two days before making the injections.

The injection is most conveniently made at 6 or 7 o'clock in the morning, and the maximum temperature will then usually be reached by or before 10 o'clock p. m. of the same day.

Use for each horse one cubic centimeter of the malleine solution as sent out, and make the injection beneath the skin of the middle of one side of the neck, where any local swelling can be readily detected.

Carefully sterilize the syringe, after injecting each horse, by flaming the needle over an alcohol lamp, or, better, use separate syringes for healthy and suspected animals. If the same syringe is used, inject the healthy animals first, and flame the needle of the syringe after each injection.

Take the temperature every two hours for at least eighteen hours after the injection. Sterilize the thermometer in a 5% solution of carbolic acid, or a 2% solution of corrosive sublimate, after taking the temperature of each animal.

The temperature will begin to rise, as a rule, from four to eight hours after the injection, and reach its maximum from ten to sixteen hours after the injection. On the day succeeding the injection, take the temperature at least three times.

In addition to the febrile reaction, note the size, appearance and duration of any local swelling at the point of injection.

Note the general condition and symptoms of the animal, both before, during and after the test. After four or five days the injection may be repeated if the reaction from the first injection is not entirely satisfactory.

Keep the solution in the sealed bottle and in a cool place; when it leaves the laboratory of the Bureau it is free from germs.

The following will show results of two cases tested with malleine. Case No. 1, as test indicated, was free from glanders; and case No. 2 did, as test indicated, have the disease. An especial notice of the recorded temperatures will be of much interest.

MALLEINE TEST.

CASE NO 1.		
Day before injection.		
	Time of day.	Temperature.
June 8 ...	6:30 a. m.	99
8 ...	11:30 a. m.	99 1-5
8....	6:50 p. m.	99
Day of injection, 1 c. c injected.		
June 9....	7:00 a. m.	99 1-5
9 ...	8:30 a. m.	99
9....	10:30 a m.	99 1-5
9 ...	12:15 p. m.	100 1-5
9....	2:15 p. m.	101
9....	4:15 p m.	101 1-2
9....	6:15 p. m.	100 2 5
9....	8:15 p. m.	101
9....	10:30 p m.	100 1-2
9....	12:12 m.	99 4-5
10....	2:30 a. m.	99 3-4
Day after injection.		
June 10....	6:30 a. m.	99 1-5
10....	9:15 a. m.	99 2-5
10 ...	11:30 a. m.	99 1-2

CASE NO. 2.		
Day before injection.		
	Time of day.	Temperature.
May 5 ...	6:15 p. m.	100
6 ...	9:15 a. m.	100
6 ...	10:15 a. m	100
Day of injection, 1 c. c. injected.		
May 6 ...	10:30 p. m.	100
6 ...	12:30 p. m.	101 1-5
6 ...	2:00 p. m.	101 1-2
6....	4:00 p. m.	104 1-5
6 ...	6:00 p. m.	105 1-5
6....	8:00 p. m.	105 1-2
6....	10:00 p. m.	105 1-2
6....	12:00 m.	104 1-2
Day after injection.		
May 7....	5:00 a. m.	102 1-5
7....	7:00 a. m.	101 4-5
7....	12:00 m.	101 1-5

Case No. 1—Horse 7 years old, 15¼ hands high, in good condition; exposed to glandered horses.

Case No. 2—Bay gelding, 12 years old; exposed at pasture for eight months. Prior to injection, all external appearances normal; local swelling appeared one hour after injection: size five inches in diameter; commenced disappearing next day.

SOME FACTS NOTED AS THE RESULT OF THE INJECTION.

(1) That the injection of the malleine causes a rise in the temperature of 2 to 5 degrees F. in all horses affected with glanders, except sometimes in well developed or advanced cases of the disease, already having a temperature of 102 degrees F. or above. In no case has the maximum temperature of a glandered horse, following the injection, fallen below 103 degrees F.

(2) On the glandered horse an abrupt, hard, painful swelling 4 to 10 inches in diameter occurs at the point of injection. This generally begins to appear two to four hours after injection, continuing on the next day, and increasing in size for from one to three days, disappearing again in from three to nine days afterward.

(3) Subsequent injections in glandered horses gave similar reaction, although frequently less marked.

(4) The symptoms and lesions of glanders are frequently aggravated, and acute symptoms often develop in mild cases, by the malleine injection.

(5) Healthy horses frequently show a slight rise of temperature, of 0.5 degrees F. to 1.5 degrees F., very rarely more. In no instance, however, was there a marked swelling at the point of injection. When a slight swelling did appear, it developed in from two to six hours after the injection, and disappeared again by the next day.

(6) Subsequent injections in healthy horses gave very little or no reaction.

There were made during the year 1894, eleven tests with malleine, for the purpose of diagnosing certain suspicious cases, and seven out of the eleven were found to be affected with glanders and were condemned. The law only provides, especially, for payment for animals affected with glanders, condemned in accord with its provisions. It being almost impossible to work in an efficient manner, in regard to the eradication of all contagious maladies, it has been deemed best to take up one disease at a time. This being the case, glanders and farcy were first taken up, and now for the last six or eight years this Department has been vigorously working to exterminate this malady if possible. To entirely rid the State of every case is doubtful, but there is no question but that the Department has now complete control of it, so that but comparatively small loss can accrue to the State as a whole from this malady. During the year, however, several demands were made upon this Department to examine several cases of supposed tuberculosis. The nature of this disease being such that it is at times impossible to detect it after the most minute physical examination, recourse was had to the tuberculin test. This test is very similar to that made with malleine, and is a most valuable reagent in the detection of tuberculosis, when present in the animal economy even in the slightest degree. This reagent was discovered by Koch, and though it has proven but little if any value to the human family for the purpose for which it was primarily intended—viz., the curing of the disease—it has become indispensable to the veterinary world in the detection of tuberculosis in cattle.

Tuberculin.—This is a preparation which is made from the tuberculous animal, somewhat similar to that used for glanders (malleine). The method used is somewhat similar to that prepared from glandered animals. This is sometimes called Koch's lymph. This lymph contains no living organism or germs causing the disease, but contains the poisonous products of these germs, and by an introduction into the system, the disease, tuberculosis, should it be present, will show an

augmentation of the symptons and a fever will be produced. The products or poisons contained in this preparation are called toxins or ptomaines.

In conducting the test the following course is recommended to those who wish to obtain the most accurate results:

1. Begin to take the temperature at 8 a. m. and continue every two hours until 10 p. m. (omitting at 8 p. m. if more convenient).

2. Make the injection at 10 p. m.

3. Take the temperature next morning at 6 or 8 a. m., and every two hours thereafter until 6 or 8 p. m.

Each adult animal should receive 2 cubic centimeter (about 30 minims) of the undiluted tuberculin as it is sent from the laboratory. Yearlings and two-year-olds should receive 1 to 1½ cubic centimeters, according to size. Bulls and very large animals may receive 3 cubic centimeters. The injection is made beneath the skin of the neck or shoulders.

The two tests here below shown, numbered 1 and 2, will show result of injection in case No. 1, of an animal not diseased, and case No. 2, of one diseased. Aere not especially temperatures, as in tests with malleine.

TUBERCULIN TEST.

CASE NO. 1.			CASE NO. 2.		
Before injection.			*Before injection.*		
	Time of day.	Temperature.		Time of day.	Temperature.
Nov. 15 ...	10 00 a. m.	100 2	Nov. 15....	10:00 a. m.	100 2
15 ...	12:00 a. m.	100 2	15 ...	12:00 a. m.	100.2
15 ...	2:00 p. m.	100.8	15 ...	2:00 p. m.	100 8
15 ...	4:00 p. m.	101	15 ...	4:00 p m.	101
15 ...	6:00 p. m.	101	15 ...	6:00 p. m.	100 2
Time of injection—1 1-2 c. c. injected,			*Time of injection—1 1-2 c. c. injected.*		
Nov. 15 ...	8:00 p. m.	101.1	Nov. 15 ...	8:00 p. m.	101 2
After injection.			*After injection.*		
Nov. 16 ...	6:00 a. m.	100 4	Nov 16 ...	6:00 a m.	105
16 ...	8:00 a. m.	101	16 ...	8:00 a. m.	105 2
16 ...	10:00 a. m.	101 2	16 ..	10:00 a. m.	105.1
16 ...	12:00 a. m.	100 1	16 ...	12:00 a. m.	105 1
			16 ..	2:00 p. m.	105

Case No. 1—Gave no reaction whatever.

Case No 2—Registered Jersey heifer, 4 years old, in good condition, and presenting same symptoms as one described in Case No 1; was destroyed for examination November 27; autopsy revealed about same lesions as No. 1, and in addition, a well-defined tubercle on liver, and ovaries being diseased.

There is usually no marked local swelling at the seat of injection.

There is now and then uneasiness, trembling, and the more frequent passage of softened dung. There may also be slight acceleration of the pulse and of the breathing.

A rise in the temperature on the day following the injection of two or more degrees Fahrenheit above the maximum observed on the previous day should be regarded as an indication of tuberculosis.

For any rise less than this, repetition of the injection two or three weeks after is highly desirable.

The tuberculin test is *not infallible.* In rare cases the temperature may rise in the absence of any disease, or it may fail to rise when tuberculosis is present.

It is hardly necessary to suggest that for the convenience of the one making the test, the animals should not be turned out, but fed and watered in the stable. It is desirable to make note of the time of feeding and watering.

Glanders being now under control, it is the desire to work on tuberculosis and discover if possible the extent to which this disease lurks in our herds of cattle, and to what extent by its existence the human family is made liable to its inroads. Being transmissible in nature from dam to offspring, and also to persons using milk or meat products of such animals for food, no citizen can fail to appreciate the necessity for such work. In view of this fact, and feeling greatly the necessity of such work, we will ask for co-operation with the State Board of Health, as under their management is the supervision of the general health of the public. We sincerely hope that we may be able to do more work in the year '95 relative to this malady, than has been allowed us formerly, and thereby decrease greatly this disease, lessen also greatly the possibility of human contamination, and be of great service thereby to humanity.

TEXAS FEVER.

There being certain territory in the U. S. which is permanently infected with the germ causing splenic or Texas fever, and this disease being communicable during certain seasons to cattle located in territory not so infected, by the transportation of cattle from the infected territory, it becomes necessary every year for this State to adopt certain rules and regulations to regulate the transportation into and through this state of cattle from the infected territory, which territory is also defined in these regulations. These regulations are made by the Governor and the State Board of Agriculture. Usually these

regulations last from eight to nine months during the year. Now these regulations interfering, as they are bound to do, with certain cattle traffic, inspectors are necessary to be located to see that certain unscrupulous dealers do not violate the rules, thereby causing an outbreak among susceptible cattle, and even at times, by persistent violating, causing the permanent infection of certain territory formerly uninfected. This may be not better illustrated than by the condition of certain portions of counties in Missouri, where these rules were not observed. Inspectors were not able to be retained at all points, and as results of this non-enforced law we find that the counties of Jasper and Newton, in the latter part of 1894, were about to be quarantined against by the Federal Government. Subsequently they were quarantined against in 1895 by the U. S. Government.

SOME REASONS WHY MORE INSPECTORS SHOULD BE EMPLOYED.

From the points of Kansas City, St. Louis and St. Joseph, native cattle are either driven or shipped frequently to various portions of the State for feeding or grazing purposes. It is very essential that all these native cattle be kept track of, in order that, should any Texas fever break out among them, or should they cause any Texas fever among any other native cattle, the cause of the infection can be traced, and proper measures be taken to prevent the recurrence of such in the future. To keep track of these animals, inspectors are absolutely necessary. The method used in work is that of requiring each lot bought and desired to be grazed or shipped from the markets into the State, to only go out on permit granted by the inspector. Besides this duty, the inspectors are instructed to see that all the rules and regulations promulgated in the Governor's proclamation relative to this matter are not violated, and are most vigorously enforced. Now each inspector, besides the general duties, has as each place demands some especial duty which pertains thereto.

The methods employed to effect this work with as little friction and as much expediency as possible, are largely regulated by each individual inspector as in his judgment, being constantly on the field, may be deemed best. During the years of 1893 and 1894 we were unable to sustain any inspectors save one in St. Louis. This being the case, no tab was kept on cattle save as we were able to obtain same from Federal inspectors through their kindness. This, however, has been very inadequate, and in 1895 it shall be the effort of the department to have more inspectors than during 1894, as during that year an outbreak of Texas fever occurred in Missouri, and for its origin we are absolutely without any idea save as we might obtain same from

Kansas City inspectors, who kindly furnished this department with data from time to time during the year. This was only obtained, too, through his kindness, as we had no legal claim to this information. During the year 1894 there were inspected and permitted out from Union stock yards in St. Louis 73,198 head of cattle, Kansas City 116,691, making a total of 189,889 head. Those going from Hannibal and St. Joseph it was impossible to obtain, no inspectors being stationed there.

SOME FACTS RELATIVE TO THE CAUSE OF TEXAS FEVER.

This disease, the origin of which was so long shrouded in mystery, has been finally, by the efforts of the Bureau of Animal Industry, placed in the category of germicidal diseases—the germ causing the disease being found to be one that lives upon the red blood corpuscles, the nutrient and oxygen carriers of this fluid. By the presence and action of this germ these corpuscles are disintegrated or destroyed, thereby greatly decreasing the amount of nutritive material which the body receives. As the disease progresses these germs increase in number, and of course the body nourishment supplied necessarily decreases in the same ratio. As a result of this the symptoms noticed, namely, ænemia, dropsical and other swellings, occur. However, the mode or methods of conveyance of the infecting agent (the germ) will be of much interest also, as this has been for long a mooted and much debated question. After many surmises, and without reflecting unfavorably upon any one, I might truly say guesses, the or at any rate one of the methods of infection is found to be the Texas tick. This parasite is very similar to our grass ticks in this and other localities of the State. This tick is indigenous to the country described as infected territory in the Governor's proclamation, viz., all that country lying south or east of an irregular imaginary line running from the Pacific coast, Contra Costa county, California, in an easterly direction to the eastern boundary of California; thence southerly along the eastern boundary of California and the western boundary of Arizona, to the southwest corner of Arizona; thence easterly along the southern boundary of Arizona and New Mexico to the Rio Grande river, and easterly along that river to the county of Foley, Texas. From here the line runs diagonally in a northeasterly direction through the state of Texas and Oklahoma territory to the southern boundary of the State of Kansas, southerly along the southern boundary of Kansas until it reaches the western boundary of Missouri, where it turns and goes south along the western boundary of Missouri to the northwest corner of the State of Arkansas; thence south to the third tier of counties in

this State, when it begins to run easterly along in a zig-zag line through the states of Arkansas and Tennesee; thence northeasterly through the states of North Carolina and Virginia, following for a way the Blue Ridge mountains; still continuing in its eastern direction through Virginia, it follows for a while the Potomac river to Chesapeake bay, and follows the coast of the bay to the Atlantic ocean. Cattle from this area bearing ticks are hence infected, and capable by means of the ticks of communicating the disease to animals north of said line.

The manner in which the tick is enabled to cause the disease in susceptible animals, has, after numerous experiments on the part of the Federal Government, department of Bureau of Animal Industry, been found to be as follows: This tick, living as it does upon the so-called Southern animal, and splenic germ being a blood disease, the tick necessarily is also infected with this germ causing the disease. This tick, when once fastened upon an animal by means of small hooks, is then unable to be removed and placed upon another animal, as by the removal the small hooks are pulled off. The tick hatches from an egg and is extremely small at first, clinging to the grasses among which it was hatched. From these grasses it, as animals are driven or pass through it, gets upon them. The ticks, after being hatched, may live for a month or almost indefinitely before they become attached to animal. After gaining access to the animal and becoming attached thereto, the parasite remains there for a definite period, about two weeks, when it undergoes two changes or metamorphoses, and sheds its shell or skin. It is after this shedding that we are enabled to discover the sex of the tick. It is also about this time that infection is supposed to take place. To go back a little in the history, the female tick of the Southern animal, having become fertilized, grows to its full size, and as are its habits, drops to the ground, where she in a few hours deposits from 1000 to 2000 eggs under some rock, bark or such like object lying easily or loosely upon the surface of the ground. Should the animal (a Southern one) be in uninfected territory upon which native (northern) cattle roam, the young ticks will hatch from the eggs deposited by the full-grown female, which has fallen from the Southern animal, and as before mentioned, the native becomes its host, the parasite getting upon the native as previously mentioned. Now living, as it does, at the expense of its host, one would suppose it was almost an impossibility for the native to become diseased, as the flow of blood is from the animal to the tick, and not from the tick to the animal. But just as the moulting occurs, the tick which has become filled to repletion, is supposed to regurgitate or inject some of the blood its body contains, into the previously healthy animal.

This tick, being a direct descendant of the Texas tick, which was propagated upon infected territory and matured upon a Texan or southern animal, contains some of the germs causing Texas fever —this germ being carried clear through the generation, even through the small egg, to appear in the blood of the newly hatched tick. It is thus that one at least of the methods of infection has been demonstrated. The length of time necessary to cause infection from time of exposure is from ten to fifteen days, according to the temperature. Thus we see that from time of infection of pasture we may expect a case of fever from thirty-five or forty to forty-five days thereafter. The exact amount of cold weather the egg will stand and still be potent to hatch and cause disease is not definitely known, though very severe winters have at times passed over pastures and still not disinfected them—the egg being, as it so often is, protected from extreme cold by various objects under which they were deposited by the female.

MISSOURI WEATHER SERVICE.

Co-operating with State Board of Agriculture.

Hon. J. R. RIPPEY, Secretary State Board of Agriculture:

DEAR SIR — The subjoined report of the operations of the Missouri Weather Service for the year ending Dec. 31, 1894, is respectfully submitted.

Work in this department has been carried on during the past year along the same general line as heretofore, but lack of funds has prevented any material extension, except in the distribution of forecasts by mail, the necessary supplies for which were furnished by the National service.

STATIONS AND EQUIPMENT.

During the year seven new voluntary meteorological stations were established and eight discontinued, leaving a total of 102 stations now in operation. Of these stations, 50 are equipped with maximum and minimum thermometers and rain-gauge, 29 with exposed thermometer and rain-gauge, and 23 have rain-gauge only. Of the instruments in the hands of voluntary observers, 30 maximum thermometers, 35 minimum thermometers, 1 exposed thermometer and 75 rain-gauges are furnished by the state; 13 maximum, 12 minimum and 6 exposed thermometers and 16 rain-gauges are the property of the U. S. Weather Bureau, and 7 maximum, 8 minimum and 20 exposed thermometers and 11 rain-gauges are the personal property of the observers.

Many more new stations could have been established at points from which reports would be of much value, but there were no instruments available with which to equip them, and no funds with which to purchase a further supply.

The following instruments belonging to the State have been accidentally broken or otherwise rendered unserviceable while in use at stations, and are now stored in this office awaiting money for repairs: Twelve maximum thermometers, six minimum thermometers and eight rain-gauges. Many of the rain-gauges now in use are so cheaply made

as to be very easily rendered totally unserviceable, and in the interest of accuracy and economy should be replaced with gauges of a better make; and in order that the records at all stations may be kept in as uniform manner as possible, those observers who are now using exposed thermometers, many of which are not of standard pattern, should be furnished with maximum and minimum.

The following is a list of all active voluntary meteorological stations in the State on December 31, 1894:

Station.	County.	Observer.
Akron	Harrison	L P. Riley.
Appleton City	St. Clair	L. Theilman
Arthur	Vernon	J. T. Armstrong.
Bethany.	Harrison	Newbern & Co
Big Piney	Pulaski	S. N Page
Birch Tree	Shannon	D. Meeker
Bluffton	Montgomery	S E Miller
Boonville	Cooper	C. W Hazell.
Brunswick	Chariton	Louis Benecke.
Carrollton	Carroll	Pettit & Welch.
Carthage	Jasper	Miss Lenore Selber.
Conception.	Nodaway	Fr Adelhelm Hess.
Cowgill	Caldwell	William McCray.
Darksville	Randolph	W. H. Broaddus.
Dixon	Pulaski	J. F. Rhea
Downing	Schuyler	Matthew Coffey
East Lynne	Cass	David Sharp.
Edgehill	Reynolds	J S. Luthy.
Eight Mile	Cass	J. H. Sharp
Eldon	Miller	S. Newton
Elmira.	Ray	S. H. VanTrump
Emma	Lafayette	Henry Miller
Fairport	DeKalb	H C Burcham
Farmersville	Livingston	W. H. Baker.
Fayette	Howard	Prof T. Berry Smith
Fox Creek	St Louis	William Muir.
Fulton	Callaway	E L. Edwards.
Gallatin	Daviess	W. P. Young.
Gayoso	Pemiscot	J. W. Collet
Glasgow	Howard	Prof. C W. Pritchett
Glensted	Morgan	C. L. Burney,
Gordonville	Cape Girardeau	L. M. Bean.
Gorin	Scotland	J W Pulliam.
Greenville	Wayne	W. T. Fox
Grovedale,	Maries	Lindon Maris.
Half Way	Polk	I. C. Summers
Harrisonville	Cass	A. J. Sharp.
Hastain.	Benton	Dr J. I Brady.
Houston	Texas	E J. Tweed
Houstonia	Pettis	S J Spurgeon.
Humansville	Polk	W. E. McElree.
Ironton	Iron	W. H. Delano
Jefferson City	Cole	J. J. Henderson
Kidder	Caldwell	M. G. Allen
Lamar.	Barton	E. H. Adams.
Lamonte.	Pettis	W. D. Wade.
Langdon	Atchison	F. M Josiyn.
LaPlata	Macon	H O Clark
Lebanon	Laclede	M. W. Serl.
Lexington	Lafayette	Chas Teubner.
Liberty	Clay	Prof. J. R Eaton
Linn Creek	Camden	F. M. Henderson.
Marble Hill	Bollinger	J J. Conrad.
Marceline.	Linn	E. D. Hicks
Marshall.	Saline	W H Black.
Maryville	Nodaway	J. R. Brink.
McCune Station.	Pike	M. W. Wood.
Mexico	Audrain	J. F. Llewellyn
Miami	Saline	Dr A H. W. Sullivan.
Mine LaMotte.	Madison	J. D Sanders.
Mt. Vernon	Lawrence	E L Allen.
Neosho	Newton	Geo E Nichols
Nevada.	Vernon	C Jewell
New Boston.	Linn	A. H Helmbrecht.
New Hartford.	Pike	J. A. B. Keith.
New Haven.	Franklin	Max Eimbeck
New Madrid.	New Madrid	Powell & Hummell.
New Palestine	Cooper	A. J. Ziegle

Station.	County.	Observer.
Oakfield	Franklin	E. E. Steines
Oak Ridge	Cape Girardeau	Henry Bruihl
Olden	Howell	H Montgomery
Oregon	Holt	William Kaucher
Oregon	Holt	Sam. M Ruley
Osceola	St. Clair	Stewart Love
Oto	Stone	H. B Cox
Palmyra	Marion	J. R. Dudley
Panacea	Barry	Mrs. Carrie M. Smith
Phillipsburg	Laclede	T J. Mansfield
Pickering	Nodaway	M. B W. Harmon
Platte River	Buchanan	W. A. McDowell
Princeton	Mercer	Dr. Wm. Hirons
Potosi	Washington	C V F Hochstatter
Poplar Bluff	Butler	Dr M E. Shelton
Rea	Andrew	G. E Bedford
St. Charles	St Charles	L. C Saeger
St. Joseph	Buchanan	W R. Burcham
St. Louis (Forest park)	City of St. Louis	F. W. Duenckel
Sarcoxie	Jasper	Thos. McNallie
Shelbina	Shelby	J. S Chandler
Sikeston	Scott	Prof. D. W. Lutes
Steffenville	Lewis	E L. Hall
Sublett	Adair	Lewis Sprigge
Tindall	Grundy	J. H. Brokaw
Unionville	Putnam	J. A Townsend
Vera Cruz	Douglas	L E. Riley
Vermont	Cooper	J. R Marye
Vilas	Worth	G M. Hunt
Virgil City	Cedar	J W. May
Warrensburg	Johnson	Prof. Geo. L. Osborne
Warrenton	Warren	Prof J. H. Frick
Wheatland	Hickory	W. H. Liggett
Windsor	Henry	G. W. Goodlett

Voluntary observers take daily observations of temperature, precipitation, wind direction and cloudiness, and keep a careful record of thunder-storms, hail-storms, high winds, floods, early and late frosts, and, in fact, all phenomena, a record of which will aid in the study of local climatic peculiarities, or are likely to prove of value for future reference. Complete reports of all observations are forwarded to this office at the close of each month. Monthly reports are also received from five regular and six special stations of the National Weather Bureau in the State, and two regular and one special station of the National service, and eleven voluntary stations on the borders of adjoining states.

Owing to lack of funds, it has been impracticable to visit any of the voluntary stations for the purpose of examining the instruments or instructing the observers, and in establishing new stations this work has necessarily been imperfectly accomplished by mail.

THE MONTHLY BULLETIN.

The monthly bulletin of the Service, a neatly printed 9×13 inch, eight-page pamphlet, has been issued regularly during the year, but owing to limited appropriation, only about 225 copies could be distributed. The bulletin contains a carefully prepared summary of the report from each station, and gives the climatic history of the State from month to month. A file of these bulletins covering a period of

several years will prove a source of most valuable information regarding the climate of the State, and the longer the period covered by the records, the more valuable they will become.

THE WEEKLY WEATHER-CROP BULLETIN.

The weekly weather-crop bulletin was published during twenty-six weeks of the crop-growing season, the first number being issued on April 10th and the last on October 2d. The following extract from a circular issued by the National Weather Bureau briefly describes the weather-crop service and the system by which it is conducted:

The National Weather Bureau and the State Weather Services throughout the country collect and publish in bulletin form, from week to week during the season of planting, cultivating and harvesting of crops, prevailing weather conditions and their effects upon farming operations and crops. Both state and national bulletins are issued on Tuesday, the national bulletin treating of the general weather and crop conditions of the whole country, while state bulletins give detailed information concerning the weather and its effects upon the various staples of the several states.

All state weather services are branches of the National Bureau, and the general plan of work, in the several states, is practically identical. The National Weather Bureau furnishes, through the various local weather services, to weather-crop correspondents, a suitable blank for rendering reports, in the form of postal cards bearing the government frank, which admits of their transmission through the mail without postage. These card forms provide for a brief statement of the weather and crop conditions of the week, and also for a record of temperature and rainfall for each day; but the temperature and rainfall data can only be supplied by those who are provided with thermometers and rain-gauges. Very valuable reports, however, can be rendered by those who have not these instruments, as an intelligent and accurate statement of the general conditions, as observed by the correspondents, affords valuable information to the State Weather Service official in the preparation of his weekly bulletin.

The card reports are mailed by the special correspondents to the central station of the State Weather Service, the official in charge furnishing the necessary instructions as to time of mailing. Upon receipt of the reports at the central station of the State Service, they are carefully summarized and used in the preparation of the State Bulletin, in which the reports of the correspondents are, whenever practicable, printed in full. The bulletins are sent to co-opperating correspondents in exchange for their reports, and are published in newspapers and given conspicuous display in commercial exchanges, postoffices, and other prominent places, for the benefit of the public.

A file of these bulletins, preserved from year to year, will certainly be found a valuable and interesting means of comparison, and in time a study of them in connection with the meteorological data which the State Weather Service collects and publishes, will discover the causes of the general success or failure throughout the State of any one crop, and in case of diversified farming, point out the particular products which will average best in each section of the State; also whether other products cannot be acclimatized and profitably grown. Records of this nature must be accumulated before the science of agriculture can be advanced to the point where it will be of the greatest value to the practical farmer.

The Weather-Crop Service, which was begun as an experiment in a very limited way in 1887, has grown in importance and efficiency from year to year, until at this time it is regarded as second only to the work of issuing daily weather forecasts.

During the season of 1894, the crop correspondents of this Service numbered about 325.

The appropriation not being sufficient to allow of a very extended distribution of the bulletin from the office, the Service depended to a great extent upon the press of the State for the dissemination of the information, a copy of the bulletin being sent to every paper that desired to publish it, or extracts from it. The bulletin was also

telegraphed to the leading papers of Kansas City, St. Louis and Chicago, and was furnished by mail to a large number of agricultural papers in other states. About 750 copies of the bulletin were issued each week—275 copies being distributed to newspapers and the balance to correspondents, voluntary observers, produce merchants and others especially interested in the agricultural products of the State.

This publication is one of the most important features of the State Weather Service work, and should be given the widest circulation possible. The information which it contains is eagerly sought by the speculator, and in order that the farmer may also keep fully informed as to the condition and progress of the different crops throughout the State, especial attention should be given to the prompt dissemination of the information throughout the rural districts. Arrangements have been made by which a material increase will be made, both in the size of the bulletin and the number of copies distributed, during the season of 1895.

WEATHER FORECASTS.

Through the liberality of the National Weather Bureau, the distribution of the daily weather forecasts and frost and cold wave warnings has been greatly entended. Twenty-seven weather signal display stations have been established during the year and 12 discontinued, leaving a total of 65 stations now receiving the forecasts by telegraph.

There is also in operation a plan by which, through the co-operation of a number of the forecast displaymen, over 300 postmasters in the smaller towns and villages are furnished the forecasts by mail—the bulletins being posted by them for the benefit of the public. The distributing displaymen are furnished with franked postal cards addressed to such postmasters in their immediate section of the state as can be reached in time to make the forecasts of value, and upon receipt of the forecast telegram the message is copied on the cards, which are forwarded to their destination by the first mail. Displaymen who distribute forecasts to more than five postoffices are furnished with a rubber logotype outfit for use in duplicating the messages on the cards.

This work is performed gratuitously by the displaymen, and much credit is due them for the prompt and careful attention which they have given it.

The following is a list of the distributing centers, with the post-offices, and displaymen furnishing forecasts from each, on December 31, 1894:

Bogard, Carroll Co.—S. C. Campbell.
Coloma. Quote. Mandeville.

Bolivar, Polk Co.—Dan C. Farrar.
Buffalo. Burns. Half Way.

Boonville, Cooper Co.—W. S. Stephens.
Bunceton. N. Palestine. Vermont.

Brunswick, Charlton Co.—Louis Benecke.
Dalton. Indian Gr. Keytesville.
Newcomer. Padgett.

Cassville, Barry Co.—Wm. Talbert.
Butterfield. Exeter. Lohmarsb'g.
Pananea. Shell Knob.

Charleston, Mississippi Co.—M. V. Golder.
Bertrand. Crosno. Diehlstadt.

Clinton, Henry Co.—Prof. C. B. Reynolds.
Appleton C. Creighton. Garden City.
Hartwell. Harwood. LaDue.
Lowrey City. Montrose. Rockville.
Schell City. Urich.

Deepwater, Henry Co.—C. M. Beem.
Brownington. Mount Zion.

Gallatin, Daviess Co.—Gallatin D.-G.&G.Co.
Altamont. Bancroft. Hickory.
Jameson. Jamesport. Mabel.
Maysville. Pattonsb'g. Tindall.
Trenton. Weatherby. Winston.

Holden, Johnson Co.—H. C. Conner.
Centre View. Elm. Fulkerson.
Kingsville. Pittsville.

Jackson, Cape Girardeau Co.—Wm. Parr
Allenville. Appleton. Burfordsville.
Dutchtown. Fruitland. Gravel Hill.
Gordonville. Millersville. New Wells.
Oak Ridge. Pocahontas. Shawneet'n.

Jefferson City, Cole Co.—J. J. Henderson.
Brazito. Hickory Hill. Teal.
Wardsville.

Joplin, Jasper Co.—Herald Printing Co.
Carl Junction. Carterville. Webb City.

Lamar, Barton Co.—E. H. Adams.
Boston. Carthage. Golden City.
Iantha. Jasper. Liberal.
Lockwood. Milford. Newport.

Lathrop, Clinton Co.—N. E. Owen.
Converse. Holt. Turney's Sta.

Lebanon, Laclede Co.—M. T. Blickensderfer.
Arlington. Crocker. Dixon.
Hancock, Newburgh. Richland.
Sleeper. Stoutland. Swedeborg.

Lewiston, Lewis Co.—Everett Porter.
Monticello.

Manchester, St. L. Co.—Schreiner, Flack & Co.
Ballwin. Ellisville. Fox Creek.
Grover. Hollow. Kelpe.
Melrose. Pond.

Monroe City, Monroe Co.—E. G. Shryack.
Ely. Hunnewell. Lakenan.
Shelbina. Swinkey. Warren.

Neosho, Newton Co.—G. E. Nichols.
Anderson. Diamond. Granby.
Indian Spgs. Newtonia. Noel.
Ritchey.

New Cambria, Macon Co.—A. J. Barton.
Lagonda. Wien.

N. Florence, Montgomery Co.—C. E. Stewart.
Americus. Big Springs. Hugo.

Plattsburg, Clinton Co.—F. M. Riley.
Perrin.

Princeton, Mercer Co.—Dr. Wm. Hirons.
Alvord. Goshen. Mercer.
Mill Grove. Modena. Ravanna.

Ridgeway, Harrison Co.—H. N. Burgin.
Akron. Andover. Blythedale.
Brooklyn. Dinsmore. Eagleville.
Hatfield. Mt. Moriah,

Russellville, Cole Co.—L. G. Cash.
Decatur.

Unionville, Putnam Co.—J. A. Townsend.
Blackbird. Boomer. Boynton.
Breckenridge. Brookfield. Browning.
Cameron. Cora. Cream Ridge.
Delpha. Elko. Esper.
Graysville. Green Castle. Green City.
Hale. Hamilton. Hartford.
Howland. Keystone. Kidder.
Laclede. Martinst'n. Meadville.
Mendota.. Milan. Mooresville.
Nettleton. Omaha. Osborn.
Pollock. Powersville. Purdin.
Quinn. Stahl. Tina.
Utica. W. Liberty. Wheeling.
Xenia. Yuma.
(Forecasts are also mailed from Unionville to D. W. Pollock, St. John, Mo., for the purpose of displaying signals.

Warrensburg, Johnson Co.—G. L. Osborne.
Aubrey. Burtville. Chilhowee.
Columbus. Dresden. Fayetteville.
Greendoor. Henrietta. Hoffman.
Knob Noster. Lamonte. Montserrat.
Pleasant Hill. Robins. Strasburg.

West Plains, Howell Co.—Geo. Turner.
Brandsville. Thayer.

Forecasts are also distributed from Columbia daily to all post-offices on the Wabash railroad, from Columbia to Centralia; from Centralia east to St. Louis; from Centralia west to Kansas City; from Moberly north to Coatsville; from Brunswick northwest to Gallatin, and from Salisbury south to Glasgow; also all postoffices on the Chicago & Alton railroad, between Higginsville and Louisiana and from Mexico south to Cedar City, and on the M. K. & T. from Moberly south to Old Franklin. A large number of postoffices reached by hack from points on the roads named, and from Columbia, are also supplied.

Forecast bulletins are also sent from Columbia to agents of the Wabash railroad between Columbia and Centralia, St. Louis and Kansas City, and Moberly and Coatsville, to be posted in the depot waiting rooms.

Daily weather maps containing the forecasts and forecast bulletins are also distributed from the Weather Bureau stations at Hannibal, St. Louis, Springfield and Kansas City, and from Keokuk, Iowa, and Cairo, Illinois—the total number of places in Missouri furnished the forecasts from those stations being 232.

The distribution of forecasts, both by mail and telegraph, is being extended as rapidly as possible. All displaymen who are willing to co-operate in the work by mailing copies of the messages to postmasters in their vicinity are furnished the necessary supplies for that purpose, and all postmasters receiving the card forecasts are furnished a neat bulletin board on which to display them where they will be accessible to the general public.

The conditions under which the forecasts are furnished by telegraph at government expense are, that the person receiving them provide a set of flags and pole and halyards for displaying them; attend to hoisting the signals regularly each day, and render a monthly report to this office, on postal card forms furnished for the purpose, showing time of receipt of messages and time signals were hoisted. A suitable flagstaff can be found in almost every city, and the cost of the flags is a very small matter, if all who are interested in the displays share the expense.

GENERAL REMARKS.

During the month of February, 1894, a change was made in the instructed observer detailed by the National Weather Bureau for duty with this service, Mr. Nimmo being relieved by the present incumbent. Mr. Nimmo was an efficient and hard-working observer, and although in charge of the work but a few months, under his conduct of the service marked improvements were made in all branches.

The routine work of the service having kept the small clerical force at the central office fully occupied during the year, it has been impossible to undertake any special investigations, or to accomplish very much in the way of arranging and compiling the data collected beyond what has been necessary in the issue of the weekly and monthly bulletins. Monthly and annual temperature and precipitation normals have, however, been computed for all stations having five or more years' records, and these tables, which form a part of this report, will be found a source of valuable information, showing, as they do, the average temperature and precipitation for all sections of the State. There is a large amount of work of this character which should be done, and while as much time will be devoted to it as is possible, it cannot be prosecuted satisfactorily until further assistance is provided.

The service can be of value to the people only as the information compiled here is disseminated among them. The limited appropriation for the publication of bulletins enables us to give the public but few copies, and we must depend upon the kindness of the press for the publication and more general distribution of this matter. The efficiency of the service is secured by the detail of expert meteorologists from the U. S. Weather Bureau, and the expense to the State reduced to the minimum by its liberality in the payment of the salaries of these officers, the use of the official frank in the collection and distribution of matter pertaining to the department, the issue of necessary supplies, and the loan of instruments which, for want of funds, we have been unable to purchase.

No service could be successfully and economically maintained without the aid of an able and careful corps of crop-reporters and voluntary observers. These men note carefully the climatic conditions and their effects upon the crops, make prompt reports weekly during the crop-growing season, and serve without pecuniary remuneration.

To our voluntary observers, crop reporters and displaymen, to the press, and to the U. S. Weather Bureau, we beg to acknowledge our indebtedness and return our most sincere thanks for valuable and necessary aid in bringing this Service to its present condition, and developing such features as may be appreciated by the public.

Very respectfully,

A. E. HACKETT,
Observer U. S. Weather Bureau,
Assistant Director.

Table of Monthly and Annual Mean Temperature

At stations of the Missouri Weather Service for the year 1894.

Stations.	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Appleton City	32.7	29.6	48.8	58.6	66.0	75.6	77.0	77.1	69.0	58.9	43.6	37.8	56.2
Arthur	26.0	19.9	36.6	48 7	56.8	67.6	.....	.....	.....	53.0	38.2	33.2	.....
Atchison, Kas	27.0	26.2	46.4	57.2	64.7	74.1	76.6	78.6	68.5	57.6	40.4	35.7	54.4
Bethany	25.4	24.0	44.7	55.8	63.8	74.6	77.1	77.6	68.4	56.4	39.0	33.8	53.3
Birch Tree	37.8	35.2	51.0	58.1	64.4	73.0	74.8	75.0	69.1	58.2	44.5	38.9	56.7
Bluffton	34.0	32.1	51.5	59.0	66.7	77.6	79.3	78.6	70.2	59.2	42.7	38.0	57.4
Brunswick	29.0	26.6	47.3	57.1	65.0	74.6	77.2	77.3	69.8	57.2	40.0	36.4	54.8
Cairo, Ill	39.8	35.8	52.4	59.4	65.7	76.7	77.0	78.0	71.5	60.2	45.4	40.8	58.6
Carrollton	30.8	28.1	47.6	56.6	64.6	75.7	77.0	78.0	69.3	58.6	42.4	36.4	55.4
Carrollton, Ill	.....	29.1	48.4	55.8	64.5	77.5	.....	.....	68.7	57.5	39.6	38.0	.....
Centreville, Ia	27.8	...	45.7	59.2	64.7	.....	82.7	79.0	.....	.....	.....	.....	.....
Clarinda, Ia	20 4	21.3	41.8	53.3	62.1	73.5	76.3	77.6	66.4	53 9	34.7	30.6	51.0
Columbia	31.5	29.6	50.0	57.1	64.4	75.7	77.2	78.7	69 8	58.9	41.8	37.7	56.1
Conception	19.8	21.9	38.6	49.4	58.2	68.7	70.9	79.8	68.4	59.0	.....	33 0	.....
Cowgill	.....	.....	.....	.....	.....	.....	.....	80.2	69.9	59.7	41.2	36.9	.....
Darksville	31.8	26.3	.....	.....	65.0	75.2	78 6	80.4	69.8	57.0	40.6	36.6	.....
Dixon	.....	.....	.....	54.0	.....	.....	79.2	79.9	.....	.....	.....	.....	.....
East Lynne	28.8	25.8	45.2	.....	59.5	70.0	70.8	71.0	63.0	54.1	38.4	35.4	.....
Edgehill	37.0	34.0	49.9	57.6	65.0	75.1	75.4	75.8	67.1	56.2	43.4	37.2	56.1
Eight Mile	29.8	28.0	47.2	56.1	62.8	72.6	74.2	74.1	66.2	57.9	41.4	36.4	53.9
Eldon	34.7	31.1	49.0	55.6	63.9	73.4	75.1	78.1	69.6	60.7	43.4	37.1	56.0
Elmira	.....	.....	.....	57.3	63.8	74.3	76.8	78.0	69.6	56.6	39.2	35.6	.....
Emma	29.8	26.6	46.8	58.0	64.1	76.2	78.2	80.8	70.4	57.2	40.3	36.1	55.4
Fayette	31.2	28.0	49.8	57.4	66.5	78.0	81.0	80 4	71.1	59.6	41.0	36.9	56.7
Fox Creek	34.6	31.0	50 8	57.9	64.7	77.4	76.4	75.1	68.5	59.0	41.9	37.2	56.2
Gallatin	27.9	26.8	46.6	55.8	63.6	74.5	76.9	78.0	68.1	57.4	37.6	34.3	54.0
Gayoso	39.9	37.2	50.8	55.2	66.2	.....	73.2	74.6	69.6	56.3	43.6	37.6	.....
Glasgow	31.1	27.4	48.9	57.0	64.0	75.5	77.2	78.4	69.0	58.0	40.3	36.2	55.2
Gordonville	37.0	34.9	49.2	55.1	62.2	71.0	71.6	72.2	66.6	54.1	40.0	37.0	54.2
Gorin	26.6	24.5	43 0	52.7	63.1	75.7	78.2	76.4	66.4	53.2	35.8	33.2	52.4
Greenville	.....	.....	.....	.....	.....	81.6	77.2	78.0	70.2	57 2	.....	.....	.....
Griggsville, Ill	30.8	27.2	46.8	55.5	63.6	76.0	78.6	76.4	68.9	57.4	39.3	35.5	54.7
Grovedale	35.6	32.6	50.8	55.0	62.8	73.4	74.6	74.8	64.7	.....	.....	.....	.....
Half Way	.....	.....	.....	.....	.....	.....	.....	76.7	68.4	57.6	43.6	37.5	.....
Hannibal	30.0	27.0	47.4	55.0	62.8	75.3	77.0	76.0	68.7	57.0	38.2	35.6	54.2
Harrisonville	27.4	28.4	49.3	59.4	66.4	76.1	77.0	79.8	71.1	58.4	39.7	34 2	55.6
Hastain	32.0	30.6	47.8	57.8	63.8	75.1	76.4	78.8	.....	.....	.....	37.5	.....
Houston	34.8	32.0	48.0	55.4	61.9	70.4	72.1	73.5	65.4	54.6	43.4	37.0	54.0
Humansville	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	24.0	24.3	.....
Ironton	35.2	32 8	49.6	56.4	62.9	73.3	72.8	73.8	66.2	55.6	41.8	36.7	54.8
Jefferson City	31 0	29.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	40.4	.....
Jordan's Grove, Ill.	36.8	33.8	50.7	56.8	64.2	75.6	76.1	76.2	68.8	58.6	42.4	40.1	56.7
Kansas City	29.6	27.2	47.8	57.3	64.9	75.0	76.8	78.3	69.1	59.4	42.2	37.8	55.4
Keesee's Ferry, Ark	39.3	37.0	52.8	60.5	67.6	74.7	76.1	76.0	70.1	59.9	47.5	41.4	58.6
Keokuk, Io	28 0	25.8	46.2	58.8	63.2	75.8	78.0	76.9	64.4	56.0	36.9	34.6	53.6
Keosauqua, Io	25.6	25.5	45.7	53.8	62.6	76.2	77.7	76 4	68.5	55.9	37.2	34.8	53 3
Kidder	27.1	25.0	45.3	55.4	63.8	74.4	77.2	78.8	68.3	56.2	39.2	34.4	53.7
Lamar	33.9	30.3	49.5	58.9	65.8	74.3	75.5	75.9	69.5	58.4	45.5	39.0	56.4
Langdon	.....	.....	.....	.....	61.8	72.0	75.7	76.4	.....	.....	.....	.....	.....
LaPlata	27.6	23.6	45.4	55.2	64.5	75.4	77.5	76.9	67.3	56.4	38.3	34.6	53.6
Lebanon	35.6	32.0	50.9	58.6	64.7	73.4	75.8	77.4	69.9	59.6	45.1	40.7	57.0
Lexington	30.7	28.0	49.6	57.2	.....	74.4	75.5	76.6	68 2	58.8	42.6	37.2	.....
Liberty	30.0	28.8	49.2	60.0	67.0	77.0	77.8	79.1	71.2	58.8	41.5	36.4	56.4
Linn Creek	31.2	29.4	.....	.....	.....	.....	.....	79.2	.....	.....	46.0	40.6	.....
Marble Hill	.....	.....	.....	54.6	62.3	72.2	.....	.....	.....	.....	.....	.....	.....
Marshall	29.2	26.8	47.0	55.9	63.6	75.0	76.4	77.9	68.8	57.7	39.5	35.8	54.5
Maryville	.....	.....	.....	.....	.....	.....	76.2	76.0	63.6	49.6	32.4	29.8	.....
Mascoutah, Ill	32.4	29.0	48.5	55.7	62.8	77.8	80.9	81.0	71.4	59.4	42.4	39.4	56.7
McCune Station	29.4	26.8	47.4	53.8	62.9	75.4	76.8	75.3	67.7	56.5	39 0	35.4	53.9
Mexico	29.0	26.2	46.7	55.5	64.0	76.5	77.5	77.4	67.3	55.8	38.4	34.8	54.1
Miami	30.0	32.0	48.5	60.0	65.0	73.0	80.0	81.0	70.0	61.0	42.0	35.0	56 5
Mine LaMotte	36.8	33.8	51.0	56.7	63.1	72.4	73.2	74.6	67.8	56.7	43.1	38.6	55.6
Mt. Vernon	37.9	33.2	49.0	58.6	63.6	73.8	75.8	75.4	68.6	58.3	42.3	34.7	55.9
Neosho	33.8	32.2	50.3	59.3	65.6	74.3	76.0	.....	.....	.....	.....	.....	.....
New Boston	24.6	24.3	45.0	.....	.....	.....	.....	.....	.....	.....	.....	31.4	.....
New Hartford	30.7	27.5	49.2	56.2	63.5	80.9	80.2	75.8	71.7	60.4	40.5	38.6	56.3
New Haven	32.6	31.2	50.2	57.2	67.5	79.9	79.6	78.7	69.8	.....	38.4	35 9	.....
New Madrid	41.6	38.9	54.4	60.6	67.4	78.4	78.3	079.1	72.0	62.2	47 9	42.4	60.3
Oakfield	35.2	30.7	51.0	57.1	65.5	76.8	77.3	76.6	68.8	58.6	42.4	37.6	56.5
Oak Ridge	36.4	33.6	51.2	56.6	65.8	74.6	75.6	76.5	69.4	58.4	42.2	40.0	56.7

MEAN TEMPERATURE—Continued.

Stations.	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Olathe (Kan.)	29.8	28.9	47.4	58.0	65.4	74.1	76.1	77.4	68.4	58.3	42.0	.....	.....
Olden	39.0	36.4	51.5	58.4	65.1	73.7	75.2	76.7	70.2	60.0	47.4	41.6	57.9
Oregon *(a)*	26.0	25.8	46.0	57.9	64.6	74.6	77.1	78.9	69.2	57.4	39.6	35.6	54.4
Oregon *(b)*	26.2	25.4	45.2	56.6	64.7	73.9	77.3	77.8	68.7	56.4	39.0	34.6	53.8
Panacea	34.8	33.0	49.2	58.2	64.0	75.4	79.3	77.4	68.8	60.8	49.0	42.9	57.7
Paris	.....	28.6	47.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Phillipsburg	34.7	30.3	48.3	57.4	64.3	74.0	73.9	75.7	67.9	.....	.....	.....	.....
Pickering	23.9	23.2	42.9	51.6	57.9	69.4	72.3	73.6	66.5	55.6	36.4	32.0	50.4
Platte River	25 6	24.2	42.5	53.0	62.1	72.5	74.4	74.2	63.2	50.4	35.8	32.4	50.9
Poplar Bluff	39.0	36.5	52.8	59.4	65.0	74.6	76.0	76.8	69.8	59.4	46.4	39.4	58.0
Potosi	32 4	30.4	46.4	53.2	61.0	72.4	71.0	71.9	64.3	53.8	39.6	35.6	52.7
Princeton	25.6	24.0	46.0	56.0	62.8	74.8	78.4	77.6	67.6	55.8	37.8	33.3	53.3
Rea	.....	.....	.....	51.1	60.8	75 0	77.9	67.4	.....	.....	.....	.....	.....
St. Charles	33.4	30.2	49.6	55.6	63.6	75.3	76.4	75.1	67.8	57.6	41.6	36.2	55.2
St. Louis *(a)*	35.8	32.4	51.2	57.8	66.0	78.4	79.2	78.6	70 8	59.6	42.5	38.8	57.6
St. Louis *(b)*	33.8	30.7	49.4	55.6	63.5	74.8	75.5	75.6	.....	56.8	41.0	.....	.....
Sarcoxie	32 4	30.8	49.2	59.4	67.0	74.3	76.4	76.4	67.8	57.4	43.3	37.0	56.0
Sedalia	30.9	27.4	48.8	57.5	66.0	77.2	77.4	79.1	69.4	59.5	41.8	.....	.....
Sikeston	.....	.....	.....	.....	62.5	78.0	77.8	.....	71.1	.....	.....	.....	.....
Springfield	35.8	32.0	50.0	57.8	64.6	73.6	75.0	75.9	68.0	59.0	44.8	38.2	56.2
Sublett	.....	25.6	45.4	54.2	60.7	74.4	76.8	76.0	65.8	54.2	36.4	33.8	.....
Unionville	25.2	27.8	.....	54.6	64.4	80.2	82.0	80 1	69.8	59.6	32.6	32.4	.....
Vermont	29.0	27.6	47.6	54.8	62.8	74.1	75.3	77.1	67.4	56.1	40.2	36.2	54.0
Warrensburg	31.6	29.5	48.6	57.3	64 8	76.0	77.5	77.6	68.9	59.7	42.9	37.6	56.0
Warrenton	33.8	28.4	49 3	56.9	64.4	77.0	78.2	77.0	68.5	59.8	43.4	38.2	56.2
Whiteside	31.2	28.4	47.8	55.0	63.6	75.4	.....	76.6	64.8	.....	.....	.....	.....
Windsor	33.2	31.0	49.8	56.7	63.6	73.1	75.0	76.8	68.2	59.2	44.1	38 8	.....
Mean for State	31.4	30.8	47.7	56 1	63.7	74.5	76.5	77.0	68.5	57.6	41.0	36.7	55.1

Table of Monthly and Annual Precipitation

At stations of the Missouri Weather Service for the year 1894.

Stations.	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Akron	0.95	1.60	.....	.....	1 42	.....	.....	1.22	3.33	2.25	.....	.....	.....
Appleton City	3.55	1.50	2.80	3.29	7.56	7.13	8.15	1.83	3.87	1.86	2.17	2.55	46.26
Arlington	2.48	.....	4.08	3.27	7.38	1.56	.....	.....	.....	.....	.....	.....	.....
Arthur	2.92	1.22	2.20	3.63	8.78	5.50	3.30	1.61	6.90	0.83	1 65	3 24	41.78
Atchison, Kans	1.02	0.92	1.79	2.43	1.68	7.21	2.90	0 07	5.89	4.33	0 80	1.05	30.09
Bagnell	.....	.....	2.89	4.10	5.48	3.74	2.09	2.52	5.16	0.53	2.49	3.70	.....
Bethany	1.22	2.50	2.78	1.79	1.39	5.13	0.37	0.29	2.79	2.45	1.00	1.33	23.04
Big Piney	2.30	2.60	3.10	3.32	4.40	0.75	0.95	0.65	1.90	.....	.....	.....	.....
Birch Tree	2.27	5.21	5.14	4.64	6.09	1.99	2.44	5 02	3.59	2.44	1.00	2.24	42.07
Bluffton	2.55	2 43	2.88	2.44	4.22	2.19	0 61	1.51	4.64	1.29	1.92	3 26	29.89
Boonville	2.64	2.88	2.22	3.97	4.97	9.78	1.72	1.40	5 93	1.64	1.71	2.0	40.93
Brunswick	3.20	2.65	0.39	1.60	1.75	5.51	0.52	0.40	3.51	1.30	1.55	0.72	23.10
Cairo, Ill	2.18	4.77	4.14	2.54	2.79	1.04	1.92	1.68	2.69	1.47	1.42	3.87	30 51
Cape Girardeau	1.50	1.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Carrollton	2.40	2.40	2.59	1.70	3.85	4.99	1.83	1.44	5.31	2.04	1.54	0.89	30.96
Carrollton, Ill	.....	.....	2.37	2.02	2.32	1.90	.....	.....	3.76	0.93	1.38	3.47	.....
Carthage	.....	.....	.....	.....	.....	3 56	3.99	0.85	6.32	0.62	0.22	1.53	.....
Centreville	.....	.....	.....	3.60	5.17	0.95	1.95	1.55	5.12	1.66	2.29	4.27	.....
Centreville, Ia	1.50	.....	2.15	2.30	2.71	.....	3.50	0.65	.....	.....	.....	4.10	.....
Clarinda, Ia	0.48	1.40	1.17	2.06	1.37	4.02	0.39	0.23	2.53	2.77	0.55	0.99	17.96
Columbia	2.46	1.35	1.84	2.02	4.33	3.04	1.20	1.29	7.57	0.98	1.60	1.20	28.88
Conception	0.70	0.65	.....	3.70	2.85	5.35	2.75	0.65	3 30	4.70	2.20	1 31	.....
Cowgill	0.20	2.30	4.25	1.44	2.28	4.28	3.84	0.88	3.40	2 47	1.42	0.65	27.41
Darksville	2.95	1.80	.....	.....	2.88	4.51	0.35	0.90	2.52	1.31	1.13	0.70	.....
Dixon	.....	.....	.....	.....	.....	.....	1.72	0.89	.....	.....	.....	.....	.....
Downing	2.05	1.81	2.78	2.95	2.66	4.94	2 85	0.92	3.86	2.01	2.22	0.89	29.94
East Lynne	3.09	1.91	2.52	.....	.....	5.67	5.71	1.86	6.11	1.83	1.55	1.84	.....
Edgehill	2.94	3.68	3.37	3 47	6 83	1.14	2.61	2.46	5.03	1.62	1.60	3.75	38.50
Eight Mile	3.06	1.27	2.70	5.04	4.04	6.04	4.46	1.97	5.65	2.02	1.45	1.57	39.27
Eldon	3.15	1.29	3.10	5.07	4.81	3.34	1.62	1.53	5.58	0.69	1.80	3.43	35.41
Elmira	.....	.....	.....	1.75	1.80	4.76	1.28	0.81	3.06	3.13	1 19	1.11	.....
Emma	2 85	1.60	2.15	1.90	3.82	4.50	3.10	0.20	8.51	0.52	0.75	1.15	31.05
Fairport	1.47	1.80	3.00	2.01	1.24	5.00	1.67	0 79	3.28	2.61	0.25	1.44	24.56
Farmersville	1.65	1.90	2.92	1.81	1.19	3.44	0.31	0.67	2.80	2.24	1.46	1.15	21.54
Fayette	2.87	2.48	2.20	2.84	3.16	4.96	0.93	0.79	7.12	1.21	2.07	1.39	31.52
Fox Creek	2.82	2.40	2.73	4 12	3.88	3.93	6.01	3.27	3.56	2.08	2.04	3:22	40.06
Fulton	2.75	2.35	.....	2.77	4.42	3.70	1.97	1.78	3 53	0.65	2.12	1.06	.....
Gallatin	1.51	2 61	2.80	1.32	2.12	4.70	1.33	0.29	2.27	2.79	1.66	1.45	24.85
Gayoso	2.85	7.72	7.97	4.49	.....	.....	4.38	2.71	3.37	1.12	0.54	4 16	.....
Glasgow	2.85	2.61	1.97	1.80	4.50	3.59	1.68	0.77	4.33	0.83	1.12	0.86	26.91
Glensted	1.78	.....	.....	.....	.....	2 90	3.03	1.37	5.95	0.84	1,22	2.86	.....
Gordonville	2.46	4.02	4.20	2.54	3.64	2.30	3.07	1.44	5.40	3.62	1.90	5.79	40.38
Gorin	1.76	1.53	2.28	3.54	1.53	4.06	0.51	0.85	3.45	1.56	2.23	0.58	23.88
Grafton, Ill	.....	.....	.....	2.33	2 03	1.94	1.35	.....	3.75	1.89	1.90	3.04	.....
Greenville	.....	.....	.....	.....	.....	2 13	2.55	1.98	2.65	4.87	.....	.....	.....
Griggsville, Ill	2.06	2.30	2.15	2.85	2.30	2.97	0.78	1.19	2.78	0.78	1.48	1.32	22.96
Grovedale	2.74	2.75	3.74	4.81	4.86	1.94	2.57	3.04	4.30	1.31	1.84	3.82	37.72
Half Way	3.07	2.27	3.87	4.10	5.65	3.38	1.71	2.89	6.17	1.08	2.02	2.37	38.58
Hannibal	2.29	2.51	1.77	1.74	2.93	2.52	1.07	1.03	2.40	1.22	1.77	1 34	22.59
Harrisonville	2.70	0.99	2 16	4.46	3.98	3.92	4.28	0.35	7.16	1.39	1.16	1.51	34.06
Hastain	3.00	2.76	2.71	3.59	4.22	5.36	2.91	1.20	.....	.....	.....	3.97	.....
Hermann	3.00	2.59	3.11	3.69	3 59	2.62	0 57	1.51	4.69	1.89	2.03	3.03	32.32
Houston	1.58	1.84	5.57	6.57	7.12	1 88	1.49	2.46	3.90	1.34	1.70	3.26	38.71
Houstonia	.....	.....	.....	.....	.....	.....	3.72	0.42	6.98	0.97	1.30	1.36	.....
Humansville	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.40	2 43	.....
Ironton	2.43	4.85	4.73	4.27	8.22	1.15	3.80	1.19	5.17	1.93	1.31	4.55	43.60
Jefferson City	2.60	3.20	.....	.....	.....	.....	.....	.....	.....	.....	1.90	2.84	.....
Jordan's Grove, Ill	2.30	2.60	2.81	3.93	3.57	1.17	3.15	1.32	3.91	1.22	0.77	2.84	29.59
Kansas City	1.67	2.42	2.66	2.51	2.08	8.16	4.35	0.13	7.14	1.49	1.63	1.16	35.40
Keesee's Ferry, Ark	1.84	5.40	9.17	3.85	9.41	2.06	10.52	3.32	3.11	2.34	1.31	2.40	54.73
Keokuk, Ia	2.24	1.46	2.52	2.75	3.06	2.85	0.37	0.51	4.86	1.28	2.24	1.06	25.20
Keosauqua, Ia	1.52	1.47	3.05	6.04	2.01	1.87	0.77	0.99	7.43	1.83	1.41	0.65	29.04
Kidder	1.40	2.26	2.86	2.16	1.26	5.39	1.79	0.11	6.01	3.19	1.46	1.46	29.35
Lamar	2 77	1.95	3.88	3.48	6.51	5.38	3.28	2.39	9.21	0.91	1 38	2.00	43 14
Lamonte	3.19	1.25	2.30	2.69	3.73	3.72	3.29	0.26	6.18	1.09	1.73	2.49	31.92
Langdon	.....	.....	.....	.....	2.51	4.04	0.26	0.55	.....	.....	.....	.....	.....
LaPlata	2.42	1.44	2.43	2 33	1.39	3.40	0.25	1.15	2.34	1.40	1.08	0.44	20.07
Lebanon	2.29	3.97	5.63	5.13	3.33	3.14	1.67	0.88	5.41	0.81	2.62	2.81	38 19
Lexington	2.95	1.47	2.43	2.37	.....	8.74	1.93	0.74	6.09	1.89	1.36	1.40	.....
Liberty	1.57	1.82	2.69	3.15	1.53	5.92	3.11	0.29	4.84	3.91	1.43	1.46	31.72

TABLE OF MONTHLY AND ANNUAL PRECIPITATION—Continued.

Stations.	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Linn Creek	1.20	1.46	.....	.....	.....	.....	.....	1.00	.....	.....	5.40	4.17	.....
Louisiana	1.69	2.08	2.30	2.17	5.08	2.83	0.82	3.28	3.14	1.08	1.28	1.96	27.71
Marble Hill	.....	.....	.....	1.97	3.65	3.07	.....	1.13	4.75	3.05	1.71	3.27	.....
Marceline	1.48	2.75	3.46	1.51	1.80	4.50	0.85	0.64	6.02	2.07	1.55	0.43	27.06
Marshall	2.72	2.30	2.46	2.33	3.92	5.69	1.58	0.93	6.07	2.12	1.05	0.97	32.14
Maryville	.....	.....	.....	.....	.....	.....	.....	0.12	5.70	1.45	0.35	0.90	.....
Mascoutah, Ill	1.17	2.21	2.40	3.50	4.40	1.70	2.00	1.60	4.50	0.80	0.40	3.63	28.21
McCune Station	2.25	2.55	3.76	4.59	4.97	3.29	1.76	3.08	6.62	1.44	2.87	1.31	38.49
Mexico	2.10	2.35	2.85	2.38	5.95	6.09	2.32	0 78	6.67	0.87	2 60	1.05	36.01
Miami	3.48	2.05	2.60	1.62	2.38	4.30	2.60	0.36	5.15	1.56	0.96	1.05	28.11
Mine LaMotte	2.16	3.38	4.16	3.12	7.80	2.52	3.47	0.92	6.84	2.05	1.93	4.39	41.74
Mt. Vernon	2.98	1.53	4.22	2.73	5.07	3.56	4.81	2.14	5.78	1.53	1.38	2.10	37.83
Neosho	5.36	3.44	3.31	3.54	7.21	5.10	2.38	.....	.....	.....	.....	.....	.....
Nevada	.....	.....	2.80	2.57	3.59	6.56	2.10	4.13	6.55	0.77	1.50	1.90	.....
New Boston	2.85	1.86	1.40	.....	.....	4.76	.....	.....	.....	.....	.....	.....	.....
New Hartford	2.15	.....	3.54	3.54	3.82	.....	1.26	2.58	4.33	1.01	3.28	1.15	.....
New Haven	3.17	4.27	3.31	4.42	2.35	2.05	1.39	3.58	4 23	.....	.....	1.12	.....
New Madrid	3.25	6.63	7.44	3.51	4 88	2.41	3.44	2.80	4.44	1.15	0.58	4.18	44.71
New Palestine	2.39	1.75	1.21	3.14	3.91	5.05	3.83	1.01	6.12	1.35	0.95	1.65	32.36
Oakfield	2.73	2.28	3.05	4.68	4.71	3.08	6.23	3.27	3.54	1.87	2.14	2.78	40.36
Oak Ridge	3.12	3.78	3.44	2.50	3.20	1.90	2.70	0.90	4.50	2.90	0.80	4.91	34.65
Olathe, Kas.	1.29	2.33	2.28	3.36	1.81	6.12	4.93	2 50	6.65	1.56	2.23	.....	.....
Olden	2.41	5.75	5.51	3.15	6.70	1.67	4 01	1.13	5.79	2.95	1.14	2.66	42.87
Oregon *(a)*	1.21	2.20	2.00	1.33	2.37	4.82	0.52	0.04	3.65	2.15	0.68	1.25	22.22
Oregon *(b)*	1.17	1.81	1.89	1.31	2.26	5.26	0 47	0.05	3.68	2.23	0.67	0.98	21.78
Osceola	.....	.....	.....	2.69	8.60	.....	4.41	.....	.....	.....	.....	.....	.....
Oto	.....	.....	3.05	2.66	5.85	1.50	.....	1.00	.....	.....	.....	1.89	.....
Palmyra	2.35	2.85	2.00	2.75	2.60	2.90	0.75	1.10	3.95	1.35	3.05	1.21	26.86
Panacea	2.66	3.55	5.08	2.94	7.69	2.59	5.16	4.73	7.75	2.03	1.89	1.39	47.46
Paris	.....	2.33	1.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Phillipsburg	2.24	1.93	4.10	6.84	4.57	4.30	1.30	2.04	3.78	.....	.....	.....	.....
Pickering	0.90	1.55	1.52	0.90	1.98	3.40	1.22	0.18	3 52	2.04	0.20	1.40	18.81
Platte River	1.15	2.15	2.16	2.28	1.90	6.81	2.05	0.28	4.82	5.18	1.08	1.53	31.39
Poplar Bluff	2.97	5.00	5.64	3.65	8.33	2.33	2.16	2.39	2.72	2.79	0.62	3.92	42.52
Potosi	2.43	2.72	3.16	2.82	5.82	1.59	7.01	4.52	4.74	1.85	1.79	3.50	41.95
Princeton	1.50	2.40	1.60	1.91	1.08	3 46	1.30	1.54	3.28	2.60	1.61	1.05	23.33
Rea	.....	.....	.....	1.07	0.47	5.21	0.86	1.38	.....	.....	.....	.....	.....
Round Spring	2.57	4.49	4.91	4.43	6.05	2.51	1.66	.....	.....	.....	.....	.....	.....
St. Charles	2.86	2.37	2.94	4 57	2.37	1.81	4.90	3.06	2.77	1.87	2.53	2.04	34.09
St. Joseph	0.72	1.37	2.18	1 91	1.59	5.13	1.31	0.80	3.24	3.63	1.23	1.03	24.14
St. Louis *(a)*	2.56	2.88	2.69	2.68	3.61	1.12	1.35	1.66	3.11	1.56	1.49	2.73	27.44
St. Louis *(b)*	2.70	2.38	2.78	2.44	3.18	1.73	1.10	1.53	.....	2.06	1.42	.....	.....
Sarcoxie	3.99	1.88	2.70	2.30	6.51	5.87	5.38	1.25	5.27	1.49	1.95	2.18	40.77
Sedalia	2 86	2.31	2.33	3.43	3.94	6.46	2.81	0.68	6.76	0.52	1.29	.....	.....
Shelbina	2.50	2.10	1.80	1.80	2.90	6.90	0.90	1.50	2.60	1.40	1.70	1.10	27.20
Sikeston	.....	.....	.....	.....	3.09	2.18	3.06	.....	3.75	.....	.....	.....	.....
Springfield	2.88	2.28	3.62	4.16	6.48	2.26	2.91	1.75	8.52	1.37	1.90	2.28	40.41
Steelville	2.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Steffenville	2.29	2.11	2.34	2.31	2.24	3.36	1.18	1.49	3.22	1.22	0.88	0.51	23.15
Sublett	.....	3.00	3.70	1.37	2.12	2.30	0.60	1.10	3.48	4.05	2.05	0.35	.....
Tindall	.....	.....	.....	.....	.....	3.28	6.15	0.42	3.39	1.29	1.67	0.48	.....
Unionville	1.09	2.73	1.04	1.56	2.51	.....	1.12	1.52	4.44	2.04	1.53	0.50	.....
Vera Cruz	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.78	1.59	2.17	.....
Vermont	2.76	2.70	1.83	3.23	5.09	5.17	1.87	0.79	6.50	1.33	1.01	2.08	34.36
Vilas	0.71	1.35	2.14	1.99	1.22	2.11	0.51	1.03	2.43	2.27	1.33	1.59	18.68
Virgil City	2.65	1.40	3 21	3.92	5.10	6.05	4.53	2.44	5.93	0.90	2.06	3.37	41.56
Warrensburg	2.85	1.52	1.74	3.18	3.11	5.03	3.33	0.35	6.11	0.97	0.89	2.22	31.30
Warrenton	3.39	2.40	3.08	3.08	3.30	2.85	0.81	3.21	4.58	1.50	2.91	2.88	33.99
Wheatland	3.22	1.71	3.00	4.41	8.07	5.75	2.65	1.82	6.37	0.80	3.47	3.66	44.93
Whiteside	3.67	3.00	2.56	4.00	4.08	2.05	.....	5.64	4.00	.....	.....	.....	.....
Windsor	3.26	1.83	2.44	2.87	3.34	4.97	4.68	0.20	7.48	1.03	1.31	2.60	36.01
Mean for State	2.21	2.52	2.93	3.17	3.99	3.92	2.48	1.58	4.93	1.74	1.58	2.13	33.18

Table showing the Highest and Lowest Temperatures

Recorded at Stations of the Missouri Weather Service during 1894.

(Data from maximum and minimum thermometers except where otherwise noted.)

Stations.	Jan'y.		Feb'y.		March.		April.		May.		June.		July.		August.		September		October.		November		Decem'r		Annual.	
	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.
Appleton City	71	-14	59	- 2	82	12	90	32	89	38	100	45	99	57	98	50	95	41	85	27	75	9	69	0	100	-14
*Arthur	....	-14	....	-12	.....	5	.....	32	.....	40	.....	50	.....	.....	.....	.....	.....	.....	75	26	.....	6	.....	1	.....	-14
Atchison, Kas.	69	-17	66	0	83	8	88	30	90	36	95	46	102	56	103	50	95	38	87	27	75	12	68	-5	103	-17
Bethany	61	-20	60	- 2	82	7	89	27	99	33	98	42	104	51	105	45	93	36	87	27	70	11	66	-4	105	-20
Birch Tree	70	-14	66	8	82	14	88	28	87	37	94	42	95	52	100	49	93	42	84	31	73	17	69	-1	100	-14
*Bluffton	72	-16	60	7	82	13	92	34	94	44	102	54	102	60	110	56	98	48	85	32	75	12	68	2	110	-16
Brunswick	70	-19	55	- 2	84	11	89	30	89	37	95	37	97	57	99	52	92	41	85	28	71	9	67	-2	99	-19
Cairo, Ill.	68	- 4	64	12	78	17	87	38	87	41	94	46	95	62	100	58	90	48	85	38	73	20	66	1	100	- 4
Carrollton	69	-14	56	2	81	13	87	31	88	39	94	48	97	57	100	54	91	42	85	32	70	15	67	3	100	-14
Carrollton, Ill.	....	...	57	7	79	12	87	33	88	35	96	45	.....	.....	.....	.....	90	46	80	31	71	0	66	-2	.....	.....
Centreville, Io	61	-27	.....	.....	75	3	89	34	86	37	.....	.....	107	50	106	50	.....	.....	.....	.....	.....	.....	.....	-8	107	-27
Clarinda, Io.	50	-22	51	- 4	81	5	86	28	88	38	96	44	100	56	101	50	91	40	83	31	66	8	62	7	101	-22
Columbia	74	-16	60	0	84	11	90	30	89	56	97	43	105	50	105	44	96	42	89	28	78	10	71	1	105	-16
Conception	50	-20	60	- 5	79	8	78	28	81	37	85	50	88	59	99	50	98	38	85	30	.....	10	64	-4	99	-20
*Cowgill	....	....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	102	52	92	40	86	30	70	12	68	0	.....	....
Darksville	66	-16	54	- 5	.....	.....	.....	.....	90	36	97	42	103	56	107	50	101	41	85	30	64	10	67	0	107	-16
Dixon	....	....	....	....	.....	.....	78	34	.....	.....	.....	.....	100	63	103	57	.....	.....	.....	.....	.....	.....	.....	.....	103	....
*East Lynne	....	-16	....	- 4	.....	12	.....	.....	.....	37	.....	47	.....	56	86	52	.....	39	80	26	63	7	.....	1	.....	-16
*Edgehill	68	- 8	64	4	74	18	80	36	82	48	94	50	94	60	98	62	88	44	90	30	70	16	66	0	98	- 8
*Eight Mile	69	-16	60	- 4	79	10	82	34	83	38	93	50	97	60	98	52	89	36	87	28	72	8	61	-1	98	-16
*Eldon	72	-14	56	0	82	14	88	32	88	40	92	46	100	58	106	60	94	48	88	38	76	16	70	2	106	-14
Elmira	....	....	....	....	.....	.....	89	26	91	34	98	40	105	46	110	42	99	34	94	22	71	3	70	-2	110	...
*Emma	....	-12	....	0	.....	12	.....	38	.....	40	96	54	104	66	.....	62	.....	48	80	34	.....	16	.....	2	.....	-12
Fayette	74	-17	60	- 3	85	11	90	29	92	38	100	44	108	52	108	47	97	43	92	29	77	10	71	1	108	-17
*Fox Creek	72	-12	62	8	82	12	86	32	88	35	92	48	98	57	94	62	90	46	82	32	73	5	64	0	98	-12
*Gallatin	65	-18	58	- 2	80	7	92	31	91	35	95	49	102	58	102	55	96	39	85	30	68	9	66	-3	102	-18
*Gayoso	....	- 2	....	16	.....	20	.....	36	86	40	.....	.....	.....	60	.....	56	.....	42	80	32	.....	20	62	0	.....	- 2
Glasgow	73	-16	56	- 2	83	11	90	30	88	36	96	44	104	51	104	46	96	41	88	27	75	8	69	0	104	-16
*Gordonville	....	- 8	....	13	....	19	.....	32	.....	40	91	44	.....	58	.....	50	.....	44	.....	33	.....	18	62	0	.....	- 8
*Gorin	56	-10	....	7	72	13	89	34	.....	46	....	58	108	63	111	63	97	45	.....	30	....	12	.....	6	111	-10
Greenville	....	....	....	....	....	....	.....	.....	.....	.....	102	60	104	48	106	44	98	37	86	24	.....	.....	.....	.....	106	....
Griggsville	73	-20	55	5	81	11	88	32	95	35	98	59	103	50	102	51	95	43	83	34	75	11	60	-3	103	-20
Grovedale	75	....	72	0	82	7	90	23	93	32	103	35	105	42	106	40	96	34	.....	.....	.....	.....	.....	.....	106	-35
Half Way	....	....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	102	44	93	41	82	27	73	10	68	-1	.....	....
Hannibal	71	-14	54	4	81	12	87	32	88	39	95	44	100	51	100	49	95	44	82	28	76	10	66	0	100	-14
Harrisonville	70	-16	65	- 2	89	10	95	31	90	38	98	48	109	54	108	51	99	39	90	25	74	8	66	-1	109	-16
Hastain	66	-17	59	0	81	12	89	31	89	33	97	39	100	50	102	41	.....	.....	.....	.....	.....	.....	63	1	102	-17
Houston	66	-21	61	3	75	10	85	23	86	31	97	38	97	43	103	39	92	37	84	25	70	11	68	-4	103	-21
Humansville	....	....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	74	8	70	-2	.....	....

*Ironton	68	-10	61	10	80	13	86	33	86	42	93	47	95	55	100	47	87	46	85	30	68	18	65	0	100	-10
Jefferson City	71	-15	59	2																	75	14	69	3		-15
Jordan's Grove, Ill	67	- 7	64	8	81	16	87	31	88	35	97	41	97	55	101	49	92	42	85	30	70	16	71	2	101	- 7
Kansas City	67	-15	59	1	82	12	87	34	90	39	95	50	99	61	100	55	93	44	89	31	74	13	70	0	100	-15
Keesee's Ferry, Ark.	76	-13	67	7	84	14	91	29	92	35	102	42	104	51	102	48	97	43	89	24	77	16	75	-3	104	-13
Keokuk, Ia	69	-16	58	2	79	8	88	29	88	38	95	44	102	56	100	52	95	44	83	31	72	8	61	-2	102	-16
Keosauqua, Ia	63	-16	58	2	84	9	87	25	89	37	97	42	104	50	104	50	95	44	83	30	69	9	63	0	104	-16
Kidder	65	-19	56	- 5	81	8	90	26	91	33	98	42	102	54	105	50	96	38	86	25	66	7	65	3	105	-19
Lamar	70	-14	58	0	80	15	87	32	87	38	93	41	95	50	96	52	98	42	81	28	73	10	68	2	98	-14
Langdon									92	33	96	41	103	51	103	41									103	
*LaPlata	64	-14	54	- 8	76	16	83	34	84	48	91	54	98	60	98	60	92	46	81	36	66	14	66	-2	98	-14
Lebanon	72	-18	62	3	80	14	86	34	87	36	99	36	96	55	100	48	93	45	86	30	79	10	74	-2	100	-18
Lexington	71	-17	60	0	83	12	89	31			94	46	98	54	100	50	91	42	88	29	75	11	70	1	100	-17
Liberty	67	-13	61	0	86	13	90	33	93	38	96	45	100	56	103	50	98	39	90	28	72	12	67	1	103	-13
Linn Creek	74	-27	60	-10											105	49					79	13	70	-1		-27
Marble Hill							88	27	88	37	96	39				45		39		27		14		-2		
Marshall	71	-16	58	- 1	83	11	89	28	87	36	95	43	102	51	106	44	96	39	87	26	74	8	69	-1	106	-16
*Maryville													100	60	100	53	91	38	81	26	66	4	64	-4		
*Marcoutah (Ill.)	75	-13	60	6	82	13	92	28	93	36	102	42	105	58	107	54	95	42	86	32	70	17	64	0	107	-13
*McCum station	69	-22	55	- 4	82	13	87	34	90	35	98	48	103	47	103	45	95	40	85	26	77	11	65	-1	103	-22
Mexico	72	-15	58	0	85	12	91	29	91	38	100	42	101	52	105	47	97	39	83	28	76	6	69	0	105	-15
*Miami	70	-10	60	4	80	14	92	32	88	42	94	52	100	60	104	58	94	46	88	34	72	12	68	2	104	-10
Mine LaMotte	71	-11	64	10	82	15	87	28	85	38	93	41	94	50	97	47	89	42	83	30	69	18	67	-2	97	-11
Mt. Vernon	77	-22	61	1	82	13	90	30	88	32	98	42	100	49	102	46	98	40	88	25	70	8	66	-4	102	-22
Neosho	77	-21	62	- 3	84	11	92	27	92	32	105	41	108	45											108	-27
New Boston	66	-15	52	6	78	8																	58	2		-15
*New Hartford	73	-22	60	- 3	82	12	87	30	90	38	99	65	103	64	105	62	98	48	86	28	73	12	72	0	105	-22
*New Haven	72	-13	58	6	82	16	93	32	94	44	101	50	104	64	100	60	96	48			72	17	62	3	104	-13
New Madrid	69	- 8	65	18	79	20	90	37	91	40	99	47	101	58	101	54	92	42	84	35	75	20	68	2	101	- 8
Oakfield	73	-13	61	8	83	13	89	32	91	37	99	41	97	55	100	55	93	44	83	33	73	15	63	-1	100	-13
*Oak Ridge		- 7		15	80	16		24		40	99	42		61		53	97	46		34		20		0		- 7
Olathe (Kan.)	68	-17	61	- 4	80	8	87	29	90	35	94	42	102	52	105	48	96	38	90	25	72	10			105	-17
Olden	67	-11	68	9	80	14	88	33	89	39	97	42	101	57	103	51	91	41	85	31	74	16	70	-1	103	-11
Oregon (*a*)	65	-19	63	- 1	84	8	89	30	90	38	95	47	100	58	102	52	92	40	88	28	73	10	67	-3	102	-19
Oregon (*b*)	62	-15	60	0	83	9	88	28	90	35	94	46	102	57	105	51	92	38	86	28	70	11	65	-3	105	-15
Panacea	73	-24	65	1	82	12	89	26	98	30	98	41	98	62	96	59	90	43	87	32	74	14	72	-2	98	-24
Paris			69	- 2	81	14																				
*Phillipsburg	68	-22	58	3	79	13	86	38	85	41	93	53	94	59	100	56	94	43							100	-22
*Pickering		-22		- 4	86	6		24		31		42		52		50		38	92	32	72	7	68	-6		-22
*Platte River	64	-12	55	6	80	12	86	28	92	34	94	48	98	58	100	50	90	38	84	28	64	12	66	4	100	-12
Poplar Bluff	70	- 9	64	12	80	17	87	31	87	40	96	44	99	56	100	60	89	43	84	32	75	15	68	-4	100	- 9
Potosi	67	-15	59	0	77	5	87	22	88	31	98	36	94	43	95	43	89	35	82	23	80	8	66	-5	98	-15
Princeton	64	-20	59	- 2	80	6	89	28	93	34	102	52	105	57	104	52	94	41	85	29	68	6	67	-4	105	-20
*Rea							90	26	95	30	94	52	100	63	104	53	96	35							104	
St. Charles	73	-17	61	6	82	14	86	31	87	36	98	41	98	55	99	53	92	43	84	32	73	14	64	-2	99	-17
St. Louis (*a*)	72	-11	62	9	84	14	88	34	92	40	99	44	98	61	100	60	94	48	84	38	73	18	63	1	100	-11
St. Louis (*b*)	71	-10	62	3	82	14	87	28	88	37	96	40	97	49	101	49			85	27	74	16			101	-10
*Sarcoxie		-16		0	86	18		38		44		50		63	106	54		48	94	30	80	8		-4	106	-16
Sedalia	72	-19	59	- 4	82	9	90	31	90	37	98	46	99	58	101	52	95	38	88	31	76	8			101	-19
Sikeston									92	39	105	44	101	58			92	41								
Springfield	70	17	59	2	82	14	87	34	87	38	94	48	97	56	97	55	92	42	84	32	72	14	68	-2	97	-17
Sublett			56	- 3	78	8	89	30	89	33	99	37	102	47	101	46	95	38	82	24	68	5	64	-3	102	
Unionville	62	-22	57	- 3			87	28	96	29	99	59	104	56	102	48	98	39	90	25	77	3	73	-7	104	-22
*Vermont	55	-15	55	- 1	81	11	90	30	88	39	94	54	98	63	102	54	93	46	85	29	73	10	66	1	102	-15

TABLE SHOWING THE HIGHEST AND LOWEST TEMPERATURES—Continued.

Stations.	Jan'y.		Feb'y.		March.		April.		May.		June.		July.		August.		September		October.		November		Decem'r		Annual.	
	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.	Highest	Lowest.
*Warrensburg.....	70	-13	58	1	80	14	88	36	87	44	99	54	98	64	100	61	92	47	90	32	72	16	68	3	100	-13
Warrenton.....	70	-15	59	5	80	12	89	32	91	38	99	41	102	54	101	53	93	43	84	33	73	12	68	-1	102	-15
Whiteside.....	68	-17	53	5	80	13	86	30	89	36	98	40	....	.....	103	55	90	42	.....	.....	.....	.....	.....	.....	.....	-17
Windsor.....	73	-24	64	-10	83	13	89	30	87	36	93	44	99	50	103	46	94	41	88	27	77	11	71	-3	103	-24
For the State....	77	-27	72	-12	89	5	96	22	99	29	105	35	109	42	111	39	101	34	94	22	80	3	75	-7	111	-27

*Date from eye-reading of exposed thermometer.

Table Showing the Mean or Normal Temperature

For the year at all stations of Missouri Weather Service having five or more years' record.

Station.	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Northwest section.													
Atchison, Kas.	22.7	28.1	37.1	52.5	63.2	73.2	77.4	75.5	67.0	54.0	38.9	27.7	51.4
Bethany	21.8	26.4	34.0	50.9	61.2	74.1	75.9	73.4	66.9	54.0	37.5	30.1	50.5
Carrollton	27.0	31.0	38.1	54.2	61.5	74.0	76.0	73.9	68.0	55.3	40.8	34 4	52.8
Chillicothe	30.0	31.8	40.4	54.5	61.1	73.8	81.8	75.9	70.4	59.3	42.4	36.9	54.9
Clarinda, Ia	19.2	24.5	34.0	50.6	60.7	72.9	76.1	73.5	64.8	52 1	35.3	30.2	49.5
Conception	21.5	26.5	36.2	52.0	59.4	71.2	76.6	71.5	66.1	54.8	38.8	33.2	50.6
Corning	21.9	27.7	39.9	51.9	66.6	74.2	77.5	75.8	65.5	54.8	38.6	23.6	51.5
Excelsior Springs	.....	.....	.....	.....	.....	.....	.....	.....	63.6	51.9	.....	.....	.....
Kansas City	25.8	32.1	52.3	54.7	64.5	73.5	78.5	74.7	67 4	56.5	43.3	33.3	53.9
Kidder	.....	.....	.....	.....	.....	.....	.....	.....	67.5	.....	.....	.....	.....
Leavenworth, Kas.	24.8	31.2	40.2	54.0	64.0	73.5	77.8	75.6	67.4	55.7	40.5	31.3	53.0
Lexington	22.1	27.5	40.9	52 5	62 1	71.4	75.3	74.3	66.7	56.2	41.2	28.7	51.6
Liberty	26.6	30.4	39.7	56.3	63.9	.....	.....	75.7	68.9	56.7	40.5	33.9	.....
Nebraska City, Neb.	17.9	24.6	35.5	52.8	61.1	70.8	76.1	73.0	66.1	51.0	36.8	26.4	49.3
Oregon	22.3	28.6	38.2	52.1	63 2	72.5	76.9	74.9	66.8	54.3	39.2	28.2	51.4
Pickering	18.9	.....	.....	.....	.....	.....	72.1	68.7	63.0	52.0	36.3	27.8	.....
Platte River	20.4	26.0	36.1	51.9	60.8	71.4	76.2	72.7	65.9	51.7	37.9	30.2	50.1
Princeton	22.8	27.9	38.0	54.1	61.5	74.2	78.4	74.7	66.8	55.1	38.8	34.5	52.2
Sectional average	23.0	28.0	37.6	52.5	61.8	72.8	76.7	73.8	66.6	54.5	39.0	30.9	51.4
Northeast section.													
Griggsville, Ill	22.3	27.8	37.2	53.0	60.9	72.0	75.8	73.3	66.4	53.8	40.0	30.4	51.1
Keokuk, Ia	21.0	28.1	37.9	52.1	62.2	70.8	77.2	73.3	65.4	54.0	41.3	29.8	51.1
Kirksville	19.5	25.7	36.7	53.2	61.6	70.9	76.5	71.5	63.5	50.6	39.7	28.9	49.9
Louisiana	.....	27.9	40.8	54.0	62.6	70 7	76.8	.....	.....	.....	.....	.....	.....
Mexico	27.6	31.2	40.6	55.8	63.4	75.0	77.3	75.5	68.1	55.4	40.2	37.1	53.9
St. Charles	28.8	33.7	41.4	55.7	61 4	73.1	76.5	74.5	67.5	55.2	42.8	37.5	54.0
Upper Alton, Ill	28.4	34.6	42 3	53.9	65.8	72.6	77.9	75.2	67.4	55.4	40.6	31.5	53.8
Warrenton	29.5	32.0	41.1	56.3	64.0	74.5	77.5	76.1	67.8	54.2	41.7	34.5	54.1
Wyaconda prairie]	22.7	25.6	36.3	48.8	63.8	71.4	76.8	73.0	67.2	49.8	38.6	26.6	50.0
Sectional average	23.9	30.0	39.4	53.6	63.3	72.5	77.1	74.3	67.0	54.2	40.4	31.4	52.3
Central section.													
Boonville	25 0	29.8	41.3	54.3	64.0	73.2	76.9	76.1	66.1	56.5	39.5	28.9	52.6
Brunswick	28.6	33.0	41.0	56.4	63.1	74.3	77.1	74.5	68.7	56.1	40.5	38.1	54.3
Chamois	28.7	34.5	42.9	54.4	65.5	74.1	78.9	76.2	68.5	57.5	43.4	34.8	55.0
Columbia	29.4	34.0	41.1	56.0	62.6	74.9	76.2	74.5	68.0	56.9	42.3	38.6	54.5
Eldon	29.7	.....	.....	.....	.....	.....	76.3	75.7	69.5	58.7	43 5	37.4	.....
Fayette	26.3	32.2	41.5	56.3	64.6	74.4	78.1	76 2	69.4	56.5	41.6	34.9	54.3
Glasgow	25.4	31.7	41.5	55.5	64.3	74.0	78.0	75.4	68.4	56.5	41.4	32.1	53.7
Jefferson City	29.4	33.7	41.2	54 0	64.2	75.1	78.8	75.6	67.3	54.5	42.5	35.5	54.3
Lebanon	32.4	36.9	44.6	57.2	66.4	73.5	76.9	75.1	69.4	58.4	43.9	37.4	56.0
Marshall	25.6	.....	.....	.....	.....	.....	.....	.....	68.2	56.2	40.7	32.5	.....
Miami	23.6	30.0	40.4	55.6	64.8	73.0	77.2	74.5	68.5	55.9	40.9	33.0	53.1
Rolla	29.7	36.5	43.2	53.9	63.2	71.6	76.4	73.7	64.9	51.7	40.6	31.6	53.1
Sedalia	23.8	31.4	41.9	55.9	65.2	75.0	78.4	76.6	69.4	56.5	42.5	34.3	54.2
Sectional average	27.5	32.6	41.5	55.3	63.8	73.8	77.1	75.2	68.1	56.3	41.8	34.8	54.0
Southeast section.													
Anna, Ill.	32.7	39.2	45.2	58.4	67.5	74.7	78.8	76.9	69.4	60.1	46.1	36.7	57.1
Cairo, Ill.	33.0	39.3	47.1	58.6	67.1	74.5	79.0	76.5	69.7	59.7	48.4	39.5	57.7
Fox Creek	30.4	33.4	42.4	57.1	63.5	74.5	77.3	73.2	67.1	55.5	41.6	37.2	54.4
Gordonville	31.6	.....	.....	.....	.....	.....	.....	.....	.....	55.9	44.1	38.7	.....
Hematite	35.9	36.9	41.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Highland, Ill.	33.0	34.9	44.6	57.2	67.3	75.1	79.2	77.6	70.4	55.6	42.7	34.3	56.0
Ironton	30.2	34.8	43.5	56.0	64.0	71.4	75.1	73.4	66.0	54.6	41.7	34.2	53.7
Jefferson barracks	32.4	35.2	44.6	56.8	66.1	74 2	78.5	76.5	68.2	56 2	43.4	34.6	55.6
Mascoutah, Ill.	29.6	35.1	44.1	56.6	.....	75.0	78.0	74.5	68.3	56.3	44.2	35.0	.....
New Haven	31.3	34.9	43.2	57.3	65.4	77.2	79.0	76.0	69.4	56.4	40.8	38.5	55.8
Oak Ridge	34.3	39.3	45.1	58.5	65.5	75.2	75.0	75.3	66.6	57.7	44.9	41.0	56.5
St. Louis	28.7	35.1	43.8	56.7	66.0	74.3	79.5	76.3	69.2	58.0	46.2	36.3	55.8
Sectional average	31.7	36 2	44.0	57.2	64.8	74.3	77.1	75.1	68.3	56.3	43.5	36.9	55.4

NORMAL TEMPERATURE—Continued.

Stations.	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Southwest section.													
Appleton City	30.4	34.5	41.7	57.0	63.5	75.5	77.5	75.7	69.2	57.1	43.3	36.7	55.2
Baxter Spr'gs, Kas.	31.8	38.3	46.2	56 3	68 1	75.7	80.2	79.0	70.5	57.9	43.9	34.8	56.9
Carthage	29.8	34.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fort Scott, Kas	29.6	34 4	42.8	55.5	65.9	73.2	78.1	76.1	69.2	56.6	42.0	32.3	54.6
Harrisonville	25.4	31.2	38.8	54.3	63.2	73.4	77.7	74.0	67.4	54.1	41.2	32.0	52.7
Keesee's Ferry, Ark.	33.6	40.1	48.1	61.7	67.4	76.9	80.4	77.4	71.5	60.6	47.5	39.9	58.8
Lamar	27.2	35.3	44.0	57.1	64.6	73.4	77.9	75.0	68.2	56 6	44.2	34.9	54.9
Morse, Kas	29.1	33.1	39.7	54.6	62.0	72.0	76.1	75.0	66.4	55.4	39.8	33.0	53.0
Neosho	31.6	35.0	46.9	59.6	68.1	75.1	78.8	78.0	70.6	.....	.....	33.6	.....
Springfield	30.4	36.0	44.0	57.2	63.6	73.1	76.4	74.4	67.6	57.4	43.4	36.4	55.0
Warrensburg	25.0	31.4	41.1	56.2	63.9	74.0	78.8	75.9	68.7	56.7	39.3	34.0	53.8
Windsor	30.6	33.8	41.3	55.5	63.0	74.3	76.2	73.0	69.8	57.7	43.8	36.6	54.6
Sectional average	29.2	34.8	43.1	56 6	64.6	74.1	77.8	75.6	69.0	57.2	43.0	35.7	55.1
State average	27.1	32.3	41.1	55.0	63.7	73.5	77.1	74.8	67.8	55.5	41.5	33.9	53.6

Table Showing the Average Monthly and Annual Precipitation

At all stations of the Missouri Weather Service having five or more years' record.

(Compiled to January, 1896.)

Stations.	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Northwest section.													
Atchison, Kas	1.42	1.97	2.44	4.12	4.58	5.18	4.52	3.99	3.95	3.17	1.82	1.68	38.82
Bethany	1.55	1.66	2.63	3.24	4.48	4.05	4.29	4.72	2.68	2.00	1.42	2.06	34.81
Carrollton	1.40	2.03	3.41	4.14	5.82	3.57	5.45	4.07	3.50	2.84	2.34	1.89	41.36
Chillicothe	2.62	2.53	2.47	4.82	6.82	8.11	5.15	4.85	6.48	4 23	2 48	1.94	52.50
Clarinda, Ia	1.08	0.80	1 80	2.54	5.26	4.78	4.43	3.43	2.30	2.04	1.45	1.07	30.98
Conception	1.83	1.49	2.15	3 40	4.71	4.51	3.07	4.28	3.08	2.55	1.28	1.22	33.27
Corning	0.88	1.22	1.74	2.72	4.04	5.34	3.56	2.97	2.90	3.15	1.56	1.18	31.26
Excelsior Springs	....	....	....	....	....	....	5.26	4.96	2.75	2.55	....	....	.....
Kansas City	1.21	1.76	2.28	3.09	4.51	5.09	3.58	3.92	3.84	3.21	2.02	1.32	35.83
Kidder	0.98	....	....	....	....	....	....	....	3.32	3.12	....	.....	.....
Langdon	0.97	0.82	1.55	2.39	4.64	3.55	4 57	3.88	.....	.....	0.45	.....	.....
Leavenworth, Kas	1.34	1.59	2.38	3.36	5.58	5.23	4.32	4.08	3.53	3.03	2.28	1.53	38.25
Lexington	1 51	2.09	1.67	3.11	4.13	5.44	5.57	2.68	4.25	3.73	1.97	1.88	38.08
Liberty	0 86	.....	.....	.....	.....	.....	.....	.....	3.45	2.08	1.56	1.88	....
Nebraska City, Neb.	0.74	0.94	1.60	2.80	5.00	5.11	3.49	3.20	3.61	3.13	0.80	0.78	30.20
Oregon	1.63	1.79	2.07	3.36	4.55	4.77	4.34	4.06	3.11	2.65	1.73	1.65	35.71
Phelps City	0.77	1.19	1.96	2.89	3.44	6.87	3.02	3.38	2.56	2.52	1.60	1.23	31.43
Pickering	1.11	.....	.....	.....	4.98	4.67	3.02	3.79	2.79	1.70	0.89	1.49	.....
Platte River	1.11	.....	.....	.....	.....	.....	.....	3.00	2.67	2.56	1.07	1.75	....
Princeton	1.84	1.50	2.83	3.47	6.18	5.99	4.71	3.87	2.45	1.89	1.89	1.87	38.49
St. Joseph	1.17	1.27	2.04	3.18	4.29	5.55	3 87	3.73	2 86	3.07	1.94	1.12	34.09
Savannah	1.74	1.78	1.31	3.10	5.33	5.00	3.76	4.66	3.15	4.33	2.53	1.32	37.41
Sectional average	1.35	1.68	2 27	3.35	5.04	5.14	4.21	3.71	3.13	2.76	1.63	1.47	35.74
Northeast section.													
Big Creek	1.58	4.40	2.48	2.77	3.68	3.24	2.66	2.39	3.36	2.20	2.91	1.99	33.46
Centreview, Iowa	0.93	1.70	1.24	3.30	3.54	5.44	4.57	2.68	3.07	3.09	2.11	1.85	33.52
Edina	1.74	1.35	2.30	3.81	1.94	3.88	3.65	1.98	4.12	1.82	1.34	2.29	30.22
Frankford	1.74	1.90	2.76	2.44	4.60	6.35	5.15	3.27	3.69	2.44	2.12	1.78	38.24
Griggsville, Ill	1.88	2.73	2.54	3.87	4.78	4 68	2.59	1.78	3.26	2.41	2.35	1.58	34.45
Hannibal	1.12	1.79	2.24	2.39	4.80	4.41	2.34	1.67	2.37	3.06	1.97	1 29	29.45
Keokuk, Iowa	1 69	1.83	2.17	2 84	4.12	4.99	4.26	2.97	3.68	3.24	1.96	2.10	35.84
Keosanqua, Iowa	1.48	1.79	2.52	5.00	6.27	6.54	3.77	2.30	2.90	3.01	1.72	1.51	38.81
Kirksville	1.25	1.80	1.98	2.13	3.54	4.69	3.37	3.25	2.96	3.70	1.69	1.23	31.49
Louisiana	1 34	2 57	2.08	2.77	4.10	4.27	2.28	2.32	2 82	2 26	2.20	1.59	30.60
Macon	1.09	2.26	2.35	1.97	4.78	5 93	3.62	2.58	2.89	4.37	2.17	1.48	35.49
Mexico	1.83	2.75	2.43	3.46	4.67	4.81	3.60	2.44	3.92	2.05	2.75	2.15	36.86
St. Charles	2.14	3.38	5.62	3 50	3.89	4.06	3.09	2.64	2.55	2.26	3.18	1.91	35.22
Shelbina	1.62	2.39	2 34	2.94	4.77	4.94	3.56	2.40	3 40	3.40	2.12	1.67	35.55
Upper Alton, Ill	1.79	2.57	2.69	2 52	3.36	3.25	2.83	1.84	2.47	2.76	3.27	2.71	32.06
Warrenton	1.67	3.72	3.10	5.28	5.32	4 52	2.81	2.29	2.67	1 20	3.02	1.71	37.31
Wyaconda prairie	....	1.90	3.65	.....	2.49	3.16	4.93	2.75	6 09	4.18	2.47	3.58	.....
Sectional average	1.56	2 34	2.30	3.36	4.16	4.46	3.26	2.34	3 22	2.69	2.34	1.84	33.87
Central section.													
Arlington	2.01	2.65	2.41	3.58	4.84	3.63	2.50	3.93	3.43	1.32	2.95	1 61	34.86
Boonville	1.59	2.98	3 00	3.73	5.64	6.45	4.20	2 74	4 15	3.08	2.45	1.88	41.89
Brunswick	1.40	1.79	2.06	3 09	4.61	6.12	4.32	4.01	3.63	3.06	1.98	1.50	37.57
Chamois	1.62	3.52	1.95	3.11	3.94	5.11	2.55	1.76	4.41	3.33	3.31	2.04	36.65
Columbia	1.87	2.91	3.03	4.40	5.45	4.29	4.16	3.32	4.17	1.52	2.51	0.95	38.58
Darksville	1.84	.....	.....	.....	.....	.....	3.23	.....	.....	.....	.....	.....	.....
Eldon	1.18	.....	.....	.....	6.03	5.12	4.73	4.55	3.99	1.32	2.33	1.74	.....
Emma	1.67	2 17	2.04	3.55	3 26	3.93	5.48	1.63	3.65	1.19	1.60	1.46	31.63
Fayette	1.93	2.40	2.67	4.00	5.44	4.66	3.06	2.71	3 90	1.96	2.87	1.41	36.56
Glasgow	1.46	2.34	2.09	3.03	4.34	4.84	3.78	2.71	4.04	2.75	1.85	1.71	34.94
Jefferson City	2.05	2.59	2.92	3 26	4.28	3.94	3.73	2.23	2 17	1.69	2.19	1.68	32.72
Lamonte	1.64	2.56	2.43	4.51	5.02	4.54	5 32	3.42	3.06	1.28	1.97	1.63	37.48
Lebanon	1.88	3.20	3.37	5.85	5.97	4.67	4.26	2.19	3.24	1.70	2.78	2.31	41.43
Marshall	1.41	.....	.....	.....	.....	.....	.....	.....	3.19	1.63	2.10	1.20	.....
Miami	1.67	1.76	2.43	3.08	4.10	5.07	4.12	3.62	3.39	2.90	2.09	1.87	35.10
Rolla	2.20	2.91	3.35	5.18	5.12	4.15	5.00	3.44	3.25	2.17	2.46	2.20	41.43
Sedalia	1.96	2.55	2.59	3.71	4.98	5.45	4.26	1.98	4.02	2.58	1.99	1.89	37.96
Wet Glaize	2.12	2.14	2.40	4.77	4.96	3.78	6.27	3.12	3.16	2.07	....	.....	.....
Sectional average	1.77	2.61	2.62	4.21	5.03	4.81	4.18	2.92	3.62	2.03	2.29	1.86	37.95

AVERAGE MONTHLY AND ANNUAL PRECIPITATION—Continued.

Stations.	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Southeast section.													
Allenton	2.25	2.64	4.94	3.46	4.55	4.12	3.69	3.62	3.76	2.56	2.91	2 63	41.13
Anna, Ill	2.86	3.82	4.03	3.93	5.25	6.04	3.59	4.27	2.90	3.73	4.43	3.91	48.76
Cairo, Ill	4.12	4.18	3.84	3.90	3.83	4.51	3.66	2.85	2.57	2.96	4.23	3.38	44.03
Centerville	2.83	3.81	3.15	3.35	4.46	4.98	4.19	3.39	3.03	2.38	4.42	2.84	42.83
East Prairie	2.54	2.02	3.21	3.88	.....	.....	.....	.....	.....	.....	3.39	.....	.....
Fox Creek	2.75	2.99	3.07	4.39	5.01	3.40	2.88	2.57	2.87	1.64	3.14	2.18	36.89
Gayoso	3.48	5.43	3.93	4.20	.....	.....	3.71	2.99	3.57	2.16	3.96	4.55	.....
Gordonville	3.01	.....	.....	.....	.....	.....	.....	.....	.....	2.76	3.46	3.24	.....
Grand Tower, Ill	3.39	3.53	3.30	2.94	2.92	3.10	2.34	2.97	3.82	1.45	4.46	2.33	36.55
Hermann	2.11	2.87	3.31	3.58	4.37	4.75	3.51	3.01	3.61	2.09	3.27	1.78	38.26
Ironton	2.83	3.86	3.33	4 14	5.49	4.72	4.11	3.17	3.17	2.76	4.52	3.14	45.24
Jefferson barracks	2.26	2.63	2.84	3.20	4.35	4.72	4.29	3.60	2 87	3.11	3.49	2.17	39.63
Mascoutah, Ill	2.64	4.43	3.33	5.00	4.77	5.03	2.96	2.74	4.10	2.82	3.75	2 70	44.27
Mine LaMotte	2.27	3.72	2.78	3 86	5.14	5.07	3.67	3.28	3.11	2.62	4.18	2.92	42.61
New Haven	3.51	4.08	2.74	4.21	5.55	4.04	2.57	2.90	3.31	1.30	3.04	1.18	38.43
Oak Ridge	2.95	3.61	4.99	4.88	3.98	4.05	2.72	3.11	3.06	1.96	4.31	2.90	42.52
St. Louis	2.45	3.00	3.05	3.33	4.11	5.02	3.49	2.55	3.34	2.69	2.88	2.40	38.31
Steelville	2.67	2.48	2 10	4.16	4.98	4.72	2.98	4.32	3.54	1.67	2 87	2.12	38.61
Sectional average	2 71	3.30	3.38	3.90	4.44	4.52	3.44	3.27	3.12	2.49	3.60	2.73	40.90
Southwest section.													
Appleton City	2.47	3.35	3.21	5.07	7.10	5.98	5.48	3.43	3.06	1.86	2.01	1.69	44.71
Baxter Springs, Kas	2.52	2.11	2.92	3.92	4.78	5.42	4.62	3.57	3.40	2.74	2 52	2.78	41.30
Bolivar	1.32	2.86	2.34	2.92	4.78	4.87	3.00	2.60	2.17	3.66	3.27	2.76	36.05
Carthage	1.93	2.88	2.28	3.82	5.00	4.78	4.32	3.46	3.11	3.48	2.07	2.29	39.42
Clinton	1.15	3.62	1.76	3.33	6.74	3.11	3.26	2.65	2.92	3.58	2.09	1.64	35.85
Fort Scott, Kas	1.85	2.13	1.96	3.97	6.44	6.63	4.90	4.03	3.21	2 89	3.00	1.82	42.88
Greenfield	1.14	2.06	1.46	2.98	4.35	4.09	4.91	2.97	3.46	2.95	1.67	1.92	33.96
Harrisonville	1.51	2.39	2.42	3.81	4.29	4.39	3.60	3.83	4.27	2.82	2.16	1.96	37.45
Keesee's Ferry, Ark	2.74	4.52	4.25	4.43	6.35	4.78	5.18	5.06	4.25	3.70	3.99	3.14	52.34
Lamar	1.45	2.94	2.39	4.07	5.12	4.15	3.83	4.14	4.44	2.88	1.76	2.10	39.27
Morse, Kas	1.53	1.84	2.99	3.28	5.04	5.56	5.44	4.16	3.13	2.35	1.81	2.08	39.21
Mount Vernon	2.52	2.52	2.97	5.00	5.44	3.48	5.62	2.61	3.33	2.84	1.97	2.09	40.39
Neosho	2.48	3.07	2.97	4.34	6.01	4.95	3.20	3.91	3.47	3.70	3.02	2.76	43.88
Peirce City	1.90	4.06	2.58	3.81	4.55	5.32	5.48	4.80	3.23	4.55	3.28	2.76	45.82
Pleasant Hill	1.30	2.29	1.60	3.25	3.66	4.86	4.12	2.50	3.34	3.46	2.08	1.78	34.24
Sarcoxie	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.07	1.90	1.86	.....
Springfield	2.06	3.13	2.88	4.33	6.08	5.11	4.44	3.88	3 41	2.86	3.23	2.37	43 73
Warrensburg	1.53	2.42	2.18	3.19	4.41	4.48	3.67	3.32	3.18	2.72	1.76	1.77	34 63
Windsor	2.50	2.15	2.69	6.35	6.61	6.25	5.97	2.58	3.60	1.43	1.67	1.41	43.21
Sectional average	1.87	2.80	2.55	3.99	5.37	4.85	4.45	3.52	3.53	2.88	2.32	2.12	40.25
State average	1.85	2.55	2.62	3.76	4.81	4.76	3.91	3.15	3.32	2.57	2.44	2.00	37.74

Shipments of Agricultural Products
1894

Reported Shipments of Agricultural Products

By Counties.

The information here given in regard to the counties of the State has been compiled with a view to answering inquiries of those who desire to become citizens of Missouri, and wish to acquaint themselves, as far as may be possible, with prevailing agricultural conditions, the topography, minerals, productions, live-stock, assessed valuation, schools, annual precipitation, temperature, etc.

For the report of commodities shipped from the counties, we are indebted to the transportation companies of the State. It is to be regretted that companies are unable to make these reports uniform in character. Some report only car-load lots under name of the commodity, and classify shipments of smaller lots as "miscellaneous," as "other agricultural products," etc. In some instances, cattle, horses and hogs are classed as "cars of live-stock," and we can only enter them as "mixed live-stock."

It will be observed in some cases, that counties having a large number of sheep report no shipments of wool, occasioned by the fact that the company operating in that county classes wool as "miscellaneous matter." Where two companies operate in the same county, or where two reports are received from the same line, one as freight, and one as express, and in one instance wool is classed under its proper head and in the other as "miscellaneous matter," a very small shipment of wool is shown when compared with the number of sheep in the county.

These remarks will apply to other commodities as well as wool, but when several articles are classed under some general head, we have no means of separating them, and in some instances the companies, having made no preparation for these reports, and having kept their books for their own information only, are unable to classify them so as to give the most satisfactory answer to those seeking information as to agricultural conditions of counties.

But in most instances the statistics are sufficiently complete to answer the purpose of this report—that is, to indicate in a general way the resources of the counties, and direct immigrants to such localities as will best suit their purposes—and as satisfactory as could be made without a specific appropriation for this work.

For much data herein contained we are under obligations to State Auditor Seibert and Prof. John R. Kirk, State School Commissioner, both of whom have kindly aided us with the information at their command.

The communications received at this office evince the fact that the tide of immigration has been directed to this State, and that we are now entering upon an era of progress and advancement hitherto unknown to our people.

Prior to this, the growth of our State in the face of unfavorable circumstances has been gratifying to us, and has attracted the attention of others. The immediate future promises phenomenal results, and a full development of our agricultural and mineral resources, and a realization of the great possibilities predicted by the best thought and careful observation of those most familiar with Missouri and her conditions.

Could the hand of prophecy lift the curtain that obscures the future, could the bright sunlight of midday be thrown on coming Missouri, the revelation would be astounding, even to those who have been impressed with the great future that awaited her, and are supposed to be informed as to her unlimited resources.

Then southeast Missouri will have been thoroughly drained and leveed, and her rich alluvial cotton, wheat, corn and vegetable fields extended over territory as rich as the valley of the Nile.

Missouri's profitable orchards and vineyards will cover a million acres, and will ship thousands of trains loaded with delicious fruits, and vintage that will compare favorably with the most noted output of France.

Her blue-grass pastures will feed herds of cattle, horses, mules and sheep that will be priz-ewinners at the world's greatest live-stock exhibitions, and upon which breeders may draw for the improvement of their stock and the reputation of their herds.

Her corn field, slocated on the fertile valleys of her streams, on rich elm and walnut uplands, and on productive prairies, will feed swine, beef steers and mutton that will command fancy prices and make handsome returns to our farmers.

Our mining interest, now in its infancy, will have been more fully developed, and our tons of iron, zinc, lead and nickel will have been increased to train-loads.

Then, with a public school system and school fund unsurpassed, with a State University with its normal department, and departments of law and medicine and agriculture, all fully equipped and sufficiently endowed, with normal schools in every section of the State, eleemosynary and penal institutions advanced in management and perfect in appointments, and our State peopled with an intelligent, educated and courageous manhood, we may claim the title of Imperial Missouri, Mistress of Commonwealths.

ADAIR.

Area, taxable	360,880 acres
Land, per cent in cultivation	85
Principal agricultural products	Corn, wheat, oats, hay
Principal live-stock	cattle, hogs
Minerals developed	coal
Topography	half broken to rolling, remainder undulating prairie
Population	17,417
Assessed valuation	$5,136,891
No. horses and mules	11,767
No. cattle	21,797
Sheep	5,536
Hogs	10,675
Schools operated	76
Teachers	130
Pupils	5,944
Amount expended for schools, '94	$32,027.65
Permanent school fund	$67,953.32
Average annual precipitation	31.5 inches
Annual mean temperature	49.9 degrees

SHIPMENTS.

Cattle, cars	229	Tobacco, lbs.	7,010	Cheese	40	Potatoes	590
Hogs	277	Wool	45,360	Feathers	3,045	Bread, lbs	4,700
Horses and mules	28	Pelts	1,128	Nuts, bu	9	Lumber, cars	13
Sheep	18	Hides	209,590	Timothy seed	1,047	Ties	298
Mixed live-stock	81	Flour	347,812	Clover seed	120	Wood	41
Blooded horses, hd.	29	Shipstuff	2,750	Millet seed	700	Hoops	53
Cattle	2	Corn-meal	3,016	Beans, crates	1	Saw-dust	3
Hogs	66	Dried fruit	109,336	Tomatoes	1,080	Posts	13
Wheat, cars	23	Game	3,935	Peaches	540	Brick	2
Corn	7	Lard	990	Blackberries	582	Coal	678
Oats	56	Tallow	820	Cherries	178	Lime, lbs	32,800
Rye	1	Poultry	415,078	Grapes	20	Junk, cars	2
Hay	33	Eggs, doz	167,243	Molasses, gal	104	Other, lbs	58,720
Straw	3	Butter, lbs	65,408	Apples, brls	4,206	Miscellaneous	1,713,129
Mixed grain	2						

ANDREW.

Area, taxable	270,105 acres
Land, per cent in cultivation	94
Principal agricultural products	Corn, wheat, oats and grass
Principal live-stock	Hogs, cattle, horses and sheep
Topography	Undulating upland, level bottom
Population	16,000
Assessed valuation	$5,869,325
No. horses and mules	15,821
No. cattle	25,123
Sheep	3,696
Hogs	44,575
Schools operated	86
Teachers employed	116
Pupils	5,104
Money expended for schools, '94	$41,005.64
Permanent school fund	$73,936.84
Average annual precipitation	37 4 inches
Annual mean temperature	51 degrees

SHIPMENTS.

Cattle, cars	321	Hides	2,982	Dairy products and eggs	28,000	Molasses, gals	100
Hogs	437	Flour	123,510	Fruits and vegetables, tons	976	Wine	21
Horses and mules	11	Shipstuff	8,715	Tomatoes, crates	20	Whisky	300
Sheep	6	Corn-meal	3,625	Plums	170	Cream	9,962
Mixed live-stock	294	Nursery stock	1,055	Raspberries	242	Milk	8,813
Bl'd cattle, head	1	Dried fruit	605	Blackberries	1,217	Apples, brls	27,456
Hogs	13	Veal	5,130	Strawberries	50	Potatoes	15
Wheat, cars	10	Game	1,075	Gooseberries	5	Lumber, cars	2
Corn	77	Fish	450	Currants	10	Ties	307
Oats	7	Poultry	55,571	Grapes	320	Forest products	160
Hay	2	Eggs, doz	37,763			Other	3
Mixed grain	3	Butter, lbs	33,548			Miscell'ous, lbs	293,880
Wool, lbs	2,350	Cheese	3,581				

ATCHISON.

Area, taxable	330,451 acres	No. cattle	32,876
Land, per cent in cultivation	80	Sheep	2,255
Principal agricultural products	Corn, wheat, oats, grass	Hogs	58,713
Principal live-stock	hogs, cattle	Schools operated	86
Minerals developed	coal	Teachers employed	120
Topography	level to rolling	Pupils	5,044
Population	15,553	Money expended for schools, 1894	$48,806.51
Assessed valuation	$7,227,080	Permanent school fund	$134,509.96
No. horses and mules	15,290	Average annual precipitation	34.4 inches
		Annual mean temperature	50 degrees

SHIPMENTS.

Cattle, cars	1,381	Wheat, cars	118	Fish	180	Lumber, cars	7
Hogs	497	Corn	923	Poultry	11,665	Ties and wood	3
Horses and mules	3	Oats	13	Eggs, doz	2,240	Junk	4
Sheep	7	Mixed grain	2	Butter, lbs	1,097	Fruit, lbs	2,497
Mixed live-stock	5	Dried fruit, lbs	300	Onions, bu	1,000	Miscellaneous	1,677,281
Hogs, head	4	Game	400	Apples, brls	85,388		

AUDRAIN.

Area, taxable	433,170 acres	No. cattle	26,514
Land, per cent in cultivation	100.00	Sheep	30,245
Principal agricultural products	Corn, oats, wheat and grass	Hogs	20,758
Principal live-stock	cattle, hogs, horses	Schools operated	102
Minerals developed	coal, fire-clay	Teachers	151
Topography	level to undulating	Pupils	6,982
Population	22,074	Money expended, schools, 1894	$52,598 76
Assessed valuation	$9,310,361	Permanent school fund	62,860 98
No. horses and mules	17,666	Average annual precipitation	36.9 inches
		Annual mean temperature	53.9 degrees

SHIPMENTS.

Cattle, cars	584	Wool, lbs	193,100	Cheese	200	Hoops	5
Hogs	433	Pelts	31,064	Feathers	10,265	Brick	267
Horses and mules	128	Hides	102,560	Onions, bu	146	Tiling	13
Sheep	124	Flour	1,491,640	Timothy seed	1,906	Stone	5
Mixed live-stock	65	Shipstuff	35,000	Clover seed	25	Iron	2
Rl'd horses, head	104	Beeswax	2,200	Millet seed	67	Coal	418
Hogs	19	Veal	790	Grass seed	12,606	Lime	549
Corn, cars	22	Game	1,500	Molasses, gals	700	Junk	8
Oats	417	Tallow	9,700	Potatoes, brls	188	Clay	14
Flax-seed	9	Poultry	925,930	Lumber, cars	7	Other	46
Broom corn	1	Eggs, doz	442,188	Ties	9	Miscel. lbs	5,684,804
Hay	362	Butter, lbs	47,284				

BARRY.

Area, taxable	347,636 acres
Land, per cent in cultivation	45
Principal agricultural products	Wheat, corn, grass, fruit
Principal live-stock	hogs and cattle
Minerals developed	lead and zinc
Topography	rolling and broken
Population	22,973
Assessed valuation	$3,143,605
No. horses and mules	10,930
No. cattle	15,440
Sheep	7,530
Hogs	24,746
Schools operated	103
Teachers	119
Pupils	8,717
Money expended for schools, 1894	$28,138.50
Permanent school fund	$28,302.43
Average annual precipitation	48 inches
Annual mean temperature	58 degrees

SHIPMENTS.

Cattle, cars	67	Pelts	1,575	Butter, lbs	7,101	Lumber, cars	52
Hogs	70	Hides	33,581	Feathers	1,654	Piling	84
Horses and mules	2	Flour	3,631,914	Onions	47	Ties	295
Sheep	3	Shipstuff	184,350	Timothy seed, bu.	480	Wood	234
Mixed live-stock	66	Corn meal	2,500	Clover seed	9,550	Posts	45
Bl'd horses, head	2	Fruit	3,015	Hungarian seed	100	Brick	2
Wheat, cars	480	Pork	1,200	Millet seed	150	Zinc	1
Corn	43	Veal	100	Molasses, gal	750	Ice	91
Oats	1	Game	18,307	Apples, brls	186	Junk	3
Mixed grain	1	Tallow	5,875	Potatoes	2,549	Sand	2
Tobacco, lbs	325	Poultry	282,009	Cotton, bales	50	Miscel'ous, lbs.	670,036
Wool	5,715	Eggs, doz	155,548				

BARTON.

Area, taxable	371,873
Land, per cent in cultivation	95
Principal agricultural products	Corn, wheat, oats, fruit
Principal live-stock	cattle, hogs
Minerals developed	coal in abundance
Topography	undulating
Population	18,504
Assessed valuation	$5,539,904
No. horses and mules	14,735
No. cattle	20,703
Sheep	4,100
Hogs	11,015
Schools operated	99
Teachers	137
Pupils	6,247
Money expended for schools, 1894	$56,792.24
Permanent school fund	$125,319.89
Average annual precipitation	39.3 inches
Annual mean temperature	54.9 degrees

SHIPMENTS.

Cattle, cars	209	Hay	1,684	Feathers	261	Wood	76
Hogs	326	Straw	1	Timothy seed, bu.	734	Brick	7
Horses and mules	65	Melons	1	Sorghum seed	367	Stone	51
Mixed live-stock	26	Wool, lbs	1,620	Millet seed	335	Coal	5,305
Bl'd horses, head	1	Furs	140	Beans, crates	4	Ice	2
Sheep	1	Hides	18,198	Sweet-pota., lbs	865	Junk	3
Hogs	15	Flour	2,071,620	Berries	4	Sand	11
Wheat, cars	42	Veal	740	Strawberries	306	Cooperage	12
Corn	138	Game	32,246	Molasses, gal	204	Provisions	42,060
Oats	208	Poultry	248,617	Apples, brls	196	Other	148
Flax seed	175	Eggs, doz	48,500	Potatoes	1,441	Miscel., lbs.	1,485,120
Broom-corn	7	Butter, lbs	14,928	Lumber, cars	8		

BATES.

Area, taxable	535,416 acres
Land, per cent in cultivation	95
Principal agricultural products	Grass, corn, wheat, oats, fruit
Principal live-stock	cattle, hogs, horses
Minerals developed	coal
Topography	undulating
Population	32,223
Assessed valuation	$9,726,414
No. horses and mules	23,456
No. cattle	27,355
Sheep	3,097
Hogs	25,311
Schools operated	135
Teachers	162
Pupils	10,135
Moneys expended (school) 1894	$67,069.01
Permanent school fund	$105,433.64
Average annual precipitation	42 inches
Annual mean temperature	54 degrees

SHIPMENTS.

Cattle, cars	581	Hides	44,631	Feathers	230	Logs	8
Hogs	473	Flour	20,290,000	Nuts, bu	8	Wood	125
Horses and mules	42	Shipstuff	46,000	Onions	20	Handle-timber	18
Sheep	7	Corn-meal	60,000	Timothy seed	88,126	Hoops	1
Mixed live-stock	82	Nursery stock	103	Millet seed	4	Saw-dust	1
Wheat	163	Castor beans	20,000	Sorghum, gal	480	Cooperage	42
Corn	653	Provisions	398	Beans, crates	8	Brick	32
Oats	272	Pork	108	Plums	16	Zinc	75
Corn-cobs	1	Game	4,060	Molasses, gal	633	Coal	25,033
Flax straw	1	Tallow	1,339	Beer	2,000	Tar	6
Flax seed	123	Poultry	592,421	Whiskey	96	Junk	7
Broom-corn	3	Eggs, doz	172,206	Apples, brls	367	Coke	2
Hay	1,129	Butter, lbs	22,781	Potatoes	484	Other	39
Mixed grain	1	Cheese	12,090	Lumber, cars	2	Miscel., lbs	1,194,123
Pelts, lbs	193						

BENTON.

Area, taxable	430,164 acres
Land, per cent in cultivation	75
Principal agricultural products	Corn, oats, grass
Principal live-stock	hogs, cattle
Mineral developed	lead
Topography	undulating and broken
Population	14,973
Assessed valuation	$3,393,031
No. horses and mules	11,293
No. cattle	23,477
Sheep	8,589
Hogs	17,279
Schools operated	94
Teachers	99
Pupils	5,446
Money expended for schools, 1894	$25,054 32
Permanent school fund	$33,908 36
Average annual precipitation	42 inches
Annual mean temperature	55 degrees

A branch of the Missouri Pacific railroad is operated in this county but does not report shipments for 1894.

BOLLINGER.

Area, taxable	360,277 acres	No. cattle	12,517
Land, per cent in cultivation	35	Sheep	11,276
Principal agricultural products	Corn, wheat, oats, barley, hay, fruit	Hogs	26,927
		Schools operated	77
Principal live-stock	cattle, hogs, horses	Teachers	79
Minerals developed	iron, zinc, kaolin	Pupils	4,982
Topography	broken, small per cent level	Money expended for schools, '94	$16,420.12
Population	13,121	Permanent school fund	$49,328.83
Assessed valuation	$2,367,130	Average annual precipitation	43 inches
No. horses and mules	7,194	Annual mean temperature	58 degrees

SHIPMENTS.

Cattle, cars	21	Hides, lbs	18,265	Butter, lbs	376	Ties	136
Hogs	24	Dried fruit	4,741	Feathers	976	Staves	26
Sheep	8	Beef	1,254	Clover seed, bu	517	Stone	3
Mixed live-stock	14	Game	4,402	Strawberries, cr.	2,746	Clay	4
Wheat	18	Poultry	615,839	Lumber, cars	1	Other	10
Wool, lbs	10,751	Eggs, doz	300,100	Piling	2	Miscel., lbs	8,375
Pelts	2,333						

No report from St. Louis, Cape Girardeau & Ft. Smith R. R.

BOONE.

Area, taxable	424,113 acres	No. cattle	18,037
Land, per cent in cultivation	82	Sheep	12,697
Principal agricultural products	Corn, wheat, oats, grass	Hogs	15,239
		Schools operated	121
Principal live-stock	cattle, hogs, horses	Teachers	156
Mineral developed	coal	Pupils	8,525
Topography	undulating	Money expended for schools, 1894	$50,622.23
Population	26,043	Permanent school fund	$67,283.77
Assessed valuation	$8,515,896	Average annual precipitation	38.6 inches
No. horses and mules	13,818	Annual mean temperature	54.5 degrees

SHIPMENTS.

Cattle, cars	467	Melons	1	Poultry	488,324	Piling	1
Hogs	595	Tobacco, lbs	100	Eggs, doz	100,675	Ties	491
Horses and mules	107	Wool	75,133	Butter, lbs	11,580	Logs	2
Sheep	77	Pelts	100,935	Cheese	70	Wood	1
Mixed live-stock	20	Hides	142,466	Feathers	35,720	Staves	1
Bl'd horses, head	152	Flour	659,912	Nuts, bu	57	Hoops	74
Cattle	25	Shipstuff	1,590	Timothy seed	480	Stone	3
Sheep	6	Corn meal	100	Clover seed	1,225	Coal	1
Hogs	27	Dried fruit	11,705	Molasses, gal	678	Tar	2
Wheat, cars	144	Pork	686	Whisky	1,890	Junk	13
Corn	12	Veal	100	Apples, brls	1,406	Other	73
Oats	20	Game	370	Potatoes	60	Miscel, lbs	715,468
Broom-corn	1	Tallow	26,025	Lumber, cars	138		

BUCHANAN.

Area, taxable	243,700 acres
Land, per cent in cultivation	90
Principal agricultural products	Wheat, corn, grass
Principal live-stock	hogs, cattle
Topography	rolling; some bottoms, level
Population	70,100
Assessed valuation	$29,133,330
No. horses and mules	13,468
Cattle	15,065
No. sheep	2,237
Hogs	17,315
Schools operated	76
Teachers	83
Pupils	26,783
Amount expended for schools, 1894	$168,570
Permanent school fund	$97,668.36
Average annual precipitation	37.4 inches
Annual mean temperature	51.1 degrees

SHIPMENTS.

Cattle, cars	104	Shipstuff	104,780	Cucumbers	620	Apples, brls	41,753
Hogs	93	Corn-meal	4,150	Tomatoes	819	Potatoes	5,646
Horses and mules	40	Nursery stock	118	Other fruit & vegetables, lbs	490,000	Lumber, cars	599
Sheep	1	Dried fruit	46,690	Cherries, crates	22	Piling	352
Mixed live-stock	185	Dressed meat	1,041,010	Peaches	1,064	Ties	507
Bl'd horses, head	50	Fish	915	Plums	1,238	Logs	10
Cattle	25	Lard	340,866	Raspberries	648	Wood	16
Hogs	41	Poultry	54,407	Blackberries	379	Forest products	110
Wheat, cars	516	Eggs, doz	4,750	Strawberries	993	Shingles	26
Corn	410	Butter, lbs	1,249	Gooseberries	8	Brick	139
Oats	3	Cheese	22,650	Currants	1	Stone	15
Rye	2	Oil cake	4,625	Grapes	652	Coal	42
Hay	11	Nuts, bu	7,220	Molasses, gals	97,660	Tar	2
Mixed grain	80	Timothy seed, bu	472	Fruit pre'ves, lbs	370	Ice	2
Melons	2	Clover seed	807	Beer, gals	11,463	Junk	18
Tobacco, lbs	72,650	Millet seed	276	Whisky	7,662	Sand	32
Pelts	10,000	Beans, crates	625	Milk	6,728	Other	3
Hides	10,000	Peas	412			Miscel., lbs	62,570,243
Flour	4,273,300						

BUTLER.

Area, taxable	393,085 acres
Land, per cent in cultivation	25
Principal agricultural products	Corn, wheat, oats, fruit
Principal live-stock	cattle, hogs, horses
Mineral developed	iron
Topography	Broken in north to level in south
Population	9,964
Assessed valuation	$2,814,344
No. horses and mules	1,889
No. cattle	9,180
Sheep	1,216
Hogs	16,266
Schools operated	52
Teachers employed	64
Pupils	3,893
Amount expended for schools, 1894	$23,289 69
Permanent school fund	45,029 54
Average annual precipitation	45 inches
Annual mean temperature	58 degrees

SHIPMENTS.

Cattle, cars	84	Hay, lbs	950	Feathers, lbs	590	Staves	726
Hogs	17	Melons, cars	103	Cotton seed, cars	2	Hoops	1
Mixed live-stock	3	Pelts, lbs	3,405	Beer, gals	9,370	Ice	14
Bl'd hogs, head	1	Beef	9,382	Lumber, cars	3,515	Junk, lbs	390
Wheat, cars	9	Game	2,387	Piling, cars	234	Other, cars	332
Corn	196	Eggs, doz	1,533	Ties	6	Miscel., lbs	88,743

CALDWELL.

Area, taxable	270,498	No. cattle	22,462
Land, per cent in cultivation	90	Sheep	26,501
Principal agricultural products	corn, grass	Hogs	23,335
Principal live-stock	hogs, cattle	Schools operated	77
Minerals developed	coal	Teachers	126
Topography	undulating, broken along streams	Pupils	4,929
Population	15,152	Amount expended for schools, '94	$37,642.25
Assessed valuation	$5,840,297	Permanent school fund	$67,100.35
No. horses and mules	13,955	Average annual precipitation	37 inches
		Annual mean temperature	53 degrees

SHIPMENTS.

Cattle, cars	566	Flax seed	1	Butter, lbs	12,159	Other agricultural products, lbs.	176,685
Hogs	669	Hay and straw	38	Dairy products.	26,606	Brick, cars.	1
Horses and mules	39	Wool, lbs.	66,090	Feathers	1,080	Stone	64
Sheep	80	Pelts	81	Fruit and vegetables, lbs	55,882	Coal	311
Bl'd cattle, head	10	Hides	47,965	Plums, crate	1	Lime	3
Hogs	6	Flour	262,215	Strawberries	392	Junk	1
Wheat, cars	180	Shipstuff	38,890	Apples, brls	8,856	Other	37
Corn	35	Poultry	647,662			Misc , lbs	463,127
Oats	22	Eggs, doz	199,565				

No report from Hamilton and Kingston R. R.

CALLAWAY.

Area, taxable	512,365	No. cattle	20,208
Land, per cent in cultivation	80	Sheep	27,761
Principal agricultural products	Corn, wheat, oats, grass	Hogs	19,252
Principal live-stock	cattle, mules	Schools operated	129
Minerals developed	coal, fire-clay	Teachers	140
Topography	north half level, south broken	Pupils	7,883
Population	25,131	Amount expended for schools, '94	$44,367.55
Assessed valuation	$7,683,783	Permanent school fund	$62,167.59
No. horses and mules	13,846	Average annual precipitation	37 inches
		Annual mean temperature	54 degrees

SHIPMENTS.

Cattle, cars	297	Mixed grain, cars	4	Poultry, lbs	169,093	Ties, cars	513
Hogs	283	Tobacco, lbs	10,750	Eggs, doz	38,133	Logs	5
Horses and mules	27	Wool	13,394	Butter, lbs	1,707	Wood	9
Sheep	69	Pelts	815	Feathers	2,604	Staves	59
Mixed live-stock	33	Hides	8,605	Nuts, bu	11	Hoops	8
Bl'd horses, head	2	Flour	487,231	Timothy seed	1,600	Posts	3
Cattle	1	Shipstuff	40,880	Clover seed	800	Brick and sand	430
Sheep	2	Nursery stock	835	Molasses, gal.	20	Coal	67
Hogs	69	Beef	136	Apples, brls	3	Clay	24
Wheat, cars	110	Game	50	Potatoes	5	Other	43
Corn	29	Tallow	1,483	Lumber, cars	17	Miscel., lbs	3,938,498
Oats	4						

CAMDEN.

Area, taxable	300,174 acres
Land, per cent in cultivation	36
Principal agricultural products	Grass, corn, wheat
Principal live-stock	cattle, hogs
Minerals developed	lead
Topography	rolling to broken
Population	10,040
Assessed valuation	$1,294,185
No. horses and mules	5,566
No. cattle	14,290
Sheep	7,593
Hogs	16,334
Schools operated	72
Teachers	72
Pupils	4,052
Amount expended for schools, '94	$11,629.36
Permanent school fund	$28,212.95
Average annual precipitation	42 inches
Average mean temperature	55 degrees

SHIPMENTS.

Cattle, cars	7	Wheat	2	Hides	1,797	Butter, lbs	275
Hogs	18	Tobacco, lbs	1,765	Game	26,290	Feathers	555
Sheep	4	Wool	494	Poultry	53,200	Other (car)	1
Mixed live-stock	58	Pelts	60	Eggs, doz	32,312	Miscel., lbs	10,159

CAPE GIRARDEAU.

Area, taxable	361,664 acres
Land, per cent in cultivation	75
Principal agricultural products	Wheat, corn, oats, clover seed
Principal live-stock	horses, hogs, cattle
Population	22,060
Assessed valuation	$5,171,700
No. horses and mules	9,037
Cattle	10,906
No. sheep	12,282
Hogs	29,333
Schools operated	87
Teachers	101
Pupils	7,827
Amount expended for schools, '94	$35,354.24
Permanent school fund	$57,720.40
Average annual precipitation	42.5 inches
Annual mean temperature	56 5 degrees

SHIPMENTS.

Cattle, cars	20	Hay	2	Poultry	65,134	Lumber, cars	48
Hogs	25	Furs, lbs	291	Eggs, doz	64,500	Ties	33
Horses and mules	1	Hides	390	Butter, lbs	11,089	Wood	60
Sheep	11	Flour	54,733,219	Dairy products	3,600	Hoops	1
Mixed live-stock	11	Shipstuff	236,700	Feathers	400	Clay	15
Blooded hogs	1	Corn meal	37,650	Provisions	6,240	Other	103
Wheat	180	Veal	1,960	Clover seed, bu	514	Miscell'ous, lbs.	29,107
Corn	2	Game	1,810	Grass seed	300		

No report from St. Louis, Cape Girardeau & Ft. Smith railroad or shipments by boat.

CARROLL.

Area, taxable	434,971 acres
Land, per cent in cultivation	90
Principal agricultural products	Corn, wheat, grass
Principal live-stock	cattle, horses, hogs, sheep
Minerals developed	coal
Topography	rolling uplands, level bottoms
Population	25,742
Assessed valuation	$10,182,106
No. horses and mules	19,051
No. cattle	26,853
Sheep	5,015
Hogs	36,272
Schools operated	131
Teachers	194
Pupils	8,109
Amount expended for schools, '94	$72,265.95
Permanent school fund	$93,759.84
Average annual precipitation	41.4 inches
Annual mean temperature	52.8 degrees

SHIPMENTS.

Cattle, cars	645	Tobacco, lbs	118,000	Greese	120,039	Potatoes	1,515
Hogs	529	Wool	17,500	Poultry	573,161	Lumber, cars	44
Horses and mules	31	Pelts	920	Eggs, doz	268,740	Logs	23
Sheep	21	Hides	105,910	Butter, lbs	37,760	Wood	5
Mixed live-stock	640	Flour	2,946,246	Feathers	8,025	Staves	16
Bl'd horses, head	14	Shipstuff	344,008	Onions, bu.	1,800	Hoops	71
Cattle	9	Corn-meal	750	Timothy seed	300	Saw-dust	18
Hogs	11	Nursery stock	3,170	Clover seed	37,300	Handle-timber	6
Dogs	2	Honey	340	Millet seed	7,450	Brick	10
Wheat, cars	619	Dried fruit	8,260	Tomatoes, crates	130	Tiling	4
Corn	450	Pork	810	Vegetables, lbs.	80,000	Stone	185
Oats	29	Game	11,276	Plums, crates	271	Junk	11
Hay	8	Provisions	80,000	Blackberries	5	Other	25
Mixed grain	29	Fish	1,200	Grapes	4	Misc., lbs	2,030,652
Melons	1	Tallow	32,900	Apples, brls	36,828		

CARTER.

Area, taxable	318,817 acres
Land, per cent in cultivation	22
Pincipal agricultural products	Corn, wheat, oats, fruit
Principal live-stock	horses, cattle
Mineral developed	iron
Topography	broken
Population	5,799
Assessed valuation	$1,407,692
No. horses and mules	1,438
No. cattle	4,611
Sheep	563
Hogs	8,149
Schools operated	26
Teachers	30
Pupils	1,527
Amount expended for schools, 1894	$9,698 45
Permanent school fund	12,426 48
Average annual precipitation	37 inches
Annual mean temperature	56 degrees

SHIPMENTS.

Cattle, cars	6	Hay	2	Piling and ties	60	Stone	229
Hogs	5	Flour, lbs	120,000	Logs	7,644	Other	19
Corn	2	Lumber, cars	3,568	Wood	19	Miscel., lbs	290,000

No report from St. Louis, Cape Girardeau and Ft. Smith R. R.

CASS.

Area, taxable	443,563 acres
Land, per cent in cultivation	90
Principal agricultural products	Corn, wheat, hay, fruit, flax
Principal live-stock	Cattle, hogs, horses, sheep
Mineral developed	coal
Topography	level to undulating
Population	28,801
Assessed valuation	$9,257,273
No. horses and mules	20,659
No. cattle	24,130
Sheep	4,566
Hogs	40,887
Schools operated	131
Teachers	194
Pupils	7,441
Amount expended for schools, '94	$65,654.75
Permanent school fund	$125,096.65
Average annual precipitation	37.4 inches
Annual mean temperature	52.7 degrees

SHIPMENTS.

Cattle, cars	709	Pelts, lbs	6,125	Butter, lbs	64,036	Molasses, gal	156
Hogs	887	Hides	57,281	Cheese	50	Beer	1,306
Horses and mules	29	Flour	2,514,049	Feathers	2,831	Whisky	244
Sheep	50	Shipstuff	566,120	Oil cake	18,705	Cream	31,000
Mixed live-stock	115	Corn-meal	6,960	Linseed oil	93,600	Milk	800
Horses, head	1	Nursery stock	2,380	Nuts, bu	36	Apples, brls	7,961
Cattle	233	Honey	1,440	Onions	161	Potatoes	239
Sheep	1	Beeswax	40	Pop-corn	2,500	Lumber, cars	18
Hogs	1,354	Castor beans	2,000	Timothy seed	6,450	Wood	46
Wheat, cars	361	Dried fruit	272	Clover seed	20,182	Hoops	1
Corn	749	Pork	375	Millet seed	27,680	Saw-dust	1
Oats	174	Veal	720	Provisions, lbs	1,770	Lime	2
Flax fiber	5	Game	10,641	Canned goods, cars	9	Ice	17
Flax seed	100	Fish	220	Garden seed, lbs	75	Junk	1
Hay	479	Lard	352	Fruit, crates	206	Clay	102
Mixed grain	55	Tallow	7,240	Blackberries	21	Other	71
Tobacco, lbs	190	Poultry	308,890	Grapes	550	Miscel., lbs	1,649,340
Wool	17,262	Eggs, doz	186,919				

CEDAR.

Area, taxable	310,942 acres
Population	15,620
Assessed valuation	$3,051,536
No. horses and mules	11,303
Cattle	17,520
Sheep	3,977
Hogs	19,671
No. schools operated	84
Teachers	106
Pupils	5,677
Money expended for schools, 1894	$28,522.34
Permanent school fund	$38,125.47
Average annual precipitation	40 inches
Annual mean temperature	55 degrees

No railroad. Products probably shipped by Polk and St. Clair counties.

CHARITON.

Area, taxable	474,175 acres
Land, per cent in cultivation	90
Principal agricultural products	Corn, wheat, oats
Principal live-stock	cattle
Mineral developed	coal
Topography	rolling, some level bottoms
Population	26,254
Assessed valuation	$7,225,995
No. horses and mules	17,395
No. cattle	29,146
Hogs	24,526
Sheep	8,322
Schools operated	146
Teachers	173
Pupils	9,612
Money expended for schools, 1894	$65,003 89
Permanent school fund	$168,351 91
Average annual precipitation	37 6 inches
Annual mean temperature	54.3 degrees

SHIPMENTS.

Cattle, cars	316	Tobacco, lbs.	1,587,800	Eggs, doz	81,020	Apples, brls	14,087
Hogs	336	Wool	9,588	Butter, lbs	6,741	Potatoes	6,378
Horses and mules	38	Pelts	1,894	Feathers	1,212	Lumber, cars	190
Sheep	24	Hides	19,355	Nuts, bu	12	Logs	6
Mixed live-stock	562	Flour	961,995	Onions	4,260	Saw-dust	9
Bl'd horse, head	1	Shipstuff	100,000	Timothy seed	1,937	Brick	56
Hogs	40	Dried fruit	42,720	Clover seed	19	Tiling	11
Wheat, cars	458	Veal	200	Plums, crates	266	Coal	1
Corn	307	Game	10,928	Raspberries	5	Junk	4
Oats	49	Fish	1,000	Molasses, gals	1,017	Sand	9
Hay	8	Tallow	560	Beer	2,416	Other	40
Straw	13	Poultry	199,298	Whisky	1,112	Miscel., lbs	1,530,781

CHRISTIAN.

Area, taxable	300,555 acres
Land, per cent in cultivation	55
Principal agricultural products	Wheat, corn, clover, timothy, fruit
Principal live-stock	cattle, hogs, horses
Minerals developed	lead and zinc
Topography	northwest undulating, southeast broken
Population	14,017
Assessed valuation	$2,429,117
No. horses and mules	8,677
No. cattle	12,501
Sheep	4,778
Hogs	25,453
Schools operated	70
Teachers	85
Pupils	5,864
Amount expended for schools, '94	$23,314.14
Permanent school fund	$20,220 50
Average annual precipitation	47 inches
Annual mean temperature	59 degrees

SHIPMENTS.

Cattle, cars	143	Hides, lbs	7,183	Butter, lbs	5,425	Ties	858
Hogs	163	Flour	205,790	Feathers	650	Logs	4
Horses and mules	4	Corn meal	1,330	Clover seed, bu	354	Wood	330
Sheep	6	Nursery stock	780	Tomatoes, cars	10	Posts	163
Mixed live-stock	186	Pork	1,850	Molasses, gal	204	Stone	12
Bl'd hogs, head	5	Veal	250	Whisky	430	Iron	2
Wheat, cars	379	Game	27,166	Apples, brls	25	Lead ore	4
Corn	3	Lard	80	Potatoes	25	Zinc	1
Tobacco, lbs	2,265	Tallow	420	Cotton, bales	872	Other	2
Wool	6,380	Poultry	317,625	Lumber, cars	23	Fruit, lbs	6,615
Pelts	80	Eggs, doz	128,230	Piling	5	Miscel	710,624

CLARK.

Area, taxable	323,252 acres
Land, per cent in cultivation	93
Principal agricultural products	Wheat, corn, oats, grass
Principal live-stock	cattle, hogs, horses
Minerals developed	coal
Topography	Undulating prairie, level bottoms
Population	15,126
Assessed valuation	$4,352,502
No. horses and mules	10,345
No. cattle	15,930
Sheep	8,570
Hogs	8,319
Schools operated	91
Teachers	102
Pupils	4,809
Amount expended for schools, '94	$29,683.29
Permanent school fund	$53,241.93
Average annual precipitation	36 inches
Annual mean temperature	51 degrees

SHIPMENTS.

Cattle, cars	121	Mixed grain	8	Butter, lbs	17,309	Piling	3
Hogs	157	Wool, lbs	7,150	Feathers	545	Ties	4
Horses and mules	24	Pelts	525	Timothy seed, bu	801	Logs	3
Sheep	7	Hides	29,330	Pickles, cars	98	Wood	50
Mixed live-stock	173	Flour	838,235	Cucumbers, cr	9,860	Staves	3
Bl'd horses, head	11	Shipstuff	126,200	Tomatoes, cars	6	Hoops	92
Cattle	3	Nursery stock	500	" crates	55	Posts	1
Hogs	25	Beef	160	Grapes	6	Brick	28
Wheat, cars	123	Pork	400	Molasses, gal	81	Tiling	11
Corn	353	Veal	300	Wine	60	Stone	14
Oats	215	Game	550	Beer	2	Lime	1
Other agricultural products, lbs	23,100	Fish	18,896	Whisky	948	Ice	1
Rye, cars	5	Tallow	11,340	Apples, brls	2,203	Junk	3
Hay	155	Poultry	558,920	Potatoes	70	Other	61
		Eggs, doz	263,848	Lumber, cars	49	Miscel., lbs	1,290,714

CLAY.

Area, taxable	252,863 acres
Land, per cent in cultivation	92
Principal agricultural products	Corn, wheat, grass, hemp, tobacco
Principal live-stock	cattle, hogs
Mineral developed	coal
Topography	rolling
Population	19,856
Assessed valuation	$7,451,162
No. horses and mules	10,057
No. cattle	18,659
Sheep	8,746
Hogs	23,334
Schools operated	77
Teachers	100
Pupils	5,459
Amount expended for schools, 1894	$44,229 16
Permanent school fund	67,340 83
Average annual precipitation	36 inches
Annual mean temperature	53.8 degrees

SHIPMENTS

Cattle, cars	617	Hides	5,591	Tomatoes, crates	200	Lumber, cars	64
Hogs	625	Flour	2,275,052	Plums	202	Other agr. products, lbs	126,075
Horses and mules	20	Shipstuff	878,350	Blackberries	119	Ties & wood, cars	26
Sheep	126	Corn-meal	125,675	Strawberries	8	Logs	9
Mixed live-stock	30	Beef	360	Grapes	19	Other forest products, lbs	126,075
Bl'd hogs, head	19	Pork	1,599	Molasses, gals	50	Saw-dust, cars	26
Wheat, cars	65	Veal	304	Wine, liquor and beer	7,087	Brick	56
Corn	71	Game	582	Cream	1,269	Coal	104
Oats	1	Fish	14,953	Fr't & veg., lbs	533,925	Ice	4
Rye	2	Lard	730	Milk, gals	19,057	Other	331
Hay and straw	25	Poultry	117,295	Apples, brls	6,044	Miscel., lbs	8,508,508
Mixed grain	4	Eggs, doz	87,990	Potatoes	284		
Melons	15	Butter, lbs	16,713				
Wool, lbs	28,958	Feathers	195				

No report from Missouri City and Excelsior Springs over the Wabash.

CLINTON.

Area, taxable	265,000 acres
Land, per cent in cultivation	92
Principal agricultural products	corn, grass
Principal live-stock	cattle, hogs
Topography	undulating
Population	17,138
Assessed valuation	$7,002,027
No. horses and mules	13,725
Cattle	27,816
No. sheep	8,181
Hogs	38,265
Schools operated	73
Teachers	116
Pupils	5,403
Amount expended for schools, 1894	$42,735.57
Permanent school fund	$42,337.53
Average annual precipitation	36 inches
Annual mean temperature	51 degrees

SHIPMENTS.

Cattle, cars	742	Wool	5,247	Tallow	11,450	Potatoes	52
Hogs	401	Pelts	99	Poultry	304,038	Lumber, cars	129
Horses and mules	74	Hides	21,092	Eggs, doz	163,140	Ties	65
Sheep	15	Flour	1,726,121	Butter, lbs	22,117	Logs	5
Mixed live-stock	697	Shipstuff	155,460	Onions	720	Wood	182
Bl'd cattle, head	35	Corn-meal	1,160	Clover seed	629	Posts	2
Hogs	291	Nursery stock	9,960	Beans, crates	4	Shingles	1
Wheat, cars	19	Furs	28	Tomatoes	97	Junk	51
Corn	161	Beef	1,064	Sweet corn	1	Coal	6
Oats	26	Veal	1,660	Vegetables, lbs	128,000	Ice	8
Hay	69	Game	201	Raspberries, crates	165	Other	18
Mixed grain	6	Fish	230	Molasses, gals	40	Miscel., lbs	3,440,634
Tobacco, lbs	650	Lard	225	Apples, brls	11,728		

COLE.

Area, taxable	233,886 acres
Land, per cent in cultivation	61
Principal agricultural products	Corn, wheat, oats, fruit
Principal live-stock	hogs, cattle, horses
Minerals developed	lead, coal
Topography	broken, undulating
Population	17,281
Assessed valuation	$4,771,583
No. horses and mules	5,478
No. cattle	8,336
Sheep	8,067
Hogs	15,750
Schools operated	60
Teachers	78
Pupils	5,797
Amount expended for schools, '94	$25,285.88
Permanent school fund	$42,253.53
Average annual precipitation	32.7 inches
Annual mean temperature	54.3 degrees

SHIPMENTS.

Cattle, cars	105	Pelts	20,505	Dairy products	80,545	Ties	791
Hogs	221	Hides	21,175	Feathers	2,553	Wood	90
Horses and mules	15	Flour	13,495,180	Clover seed, bu	2,714	Staves	1
Sheep	30	Ship-stuffs	820,000	Beans, crates	18	Brick	21
Mixed live-stock	65	Dried fruit	165	Peas	50	Coal	85
Wheat	405	Game	340	Peaches	115	Ice	95
Corn	3	Provisions	4,005	Blackberries	4	Junk	4
Flax seed	2	Dressed meat	740	Strawberries	1,718	Clay	2
Hay	4	Tallow	1,991	Beer, gal	50,122	Sand	11
Melons	1	Poultry	160,517	Soda water	32,474	Tiff	20
Tobacco, lbs	249	Eggs, doz	70,795	Patatoes, brls	17	Other	22
Wool	9,655	Butter, lbs	212,190	Lumber, cars	14	Miscel., lbs	36,682

COOPER.

Area, taxable	348,575 acres
Land, per cent in cultivation	80
Principal agricultural products	Corn, wheat, oats, grass
Principal live-stock	Cattle, hogs, horses, sheep
Minerals developed	coal
Topography	undulating
Population	22,707
Assessed valuation	$7,107,894
No. horses and mules	12,514
No. cattle	20,398
Sheep	12,986
Hogs	23,878
Schools operated	106
Teachers	126
Pupils	7,013
Amount expended for schools, '94	$36,907.13
Permanent school fund	$56,411.10
Average annual precipitation	41.9 inches
Annual mean temperature	52.6 degrees

SHIPMENTS.

Cattle, cars	413	Flour	4,011,882	Clover seed	7,060	Hoops	3
Hogs	650	Shipstuff	890,000	Sweet corn	130	Handle-timber, lbs	300
Horses and mules	50	Nursery stock	1,155	Plums	6	Brick, cars	56
Sheep	58	Pork	1,223	Molasses, gal	412	Tiling	1
Mixed live-stock	82	Game	559	Beer	3,031	Stone	77
Bl'd horses, head	1	Provisions	45,481	Whisky	156	Coal	45
Cattle	1	Lard	65	Min'al water, lbs.	3,900	Lime	28
Sheep	4	Tallow	3,967	Oil, brls	136	Stoneware	12
Hogs	17	Poultry	376,370	Apples	5,489	Tar	2
Wheat, cars	757	Eggs, doz	162,436	Potatoes	761	Ice	7
Corn	5	Butter, lbs	60,974	Lumber, cars	15	Junk	5
Oats	9	Feathers	576	Ties	27	Sand	284
Tobacco, lbs	6,500	Onions, bu	98	Logs	1	Other	2
Wool	31,302	Pop-corn	130	Wood	118	Miscel., lbs	1,138,534
Hides	46,091	Timothy seed	50				

CRAWFORD.

Area, taxable	467,984 acres
Land, per cent in cultivation	33
Principal agricultural products	Corn, wheat, oats, grass, fruit
Principal live-stock	Horses, cattle, sheep, hogs
Minerals developed	lead, iron
Topography	undulating to broken
Population	11,961
Assessed valuation	$2,696,460
No. horses and mules	5,453
No. cattle	12,391
Sheep	9,907
Hogs	14,009
Schools operated	77
Teachers	81
Pupils	4,305
Amount expended for schools, '94	$19,392.79
Permanent school fund	$22,550.56
Average annual precipitation	36.8 inches
Annual mean temperature	54 degrees

SHIPMENTS.

Cattle, cars	40	Shipstuff	5,580	Feathers	2,645	Wood	62
Hogs	53	Nursery stock	34,730	Timothy seed, bu	140	Hoops	27
Horses and mules	4	Beeswax	60	Clover seed	7,755	Stone	150
Sheep	21	Dried fruit	2,355	Millet seed	680	Iron	284
Mixed live-stock	74	Pork	300	Beans, crates	1,400	Iron ore	1
Bl'd sheep, head	2	Veal	1,300	Peas	6	Lime, lbs	200
Wheat, cars	98	Game	17,248	Molasses, gal	420	Junk, cars	1
Tobacco, lbs	200	Lard	80	Whisky	93	Sand	15
Wool	32,176	Tallow	2,810	Apples, brls	21	Charcoal	16
Pelts	3,263	Poultry	263,994	Potatoes	546	Other	10
Hides	41,975	Eggs, doz	234,490	Lumber, cars	12	Misc, lbs	574,196
Flour	624,696	Butter, lbs	33,570	Ties	221		

DADE.

Area, taxable	317,284 acres
Land, per cent in cultivation	75
Principal agricultural products	Corn, wheat, oats, grass
Principal live-stock	Hogs, sheep, cattle, horses
Minerals developed	lead, zinc, coal
Topography	eastern part broken, western part undulating
Population	17,526
Assessed valuation	$3,794,469
No. horses and mules	11,228
Cattle	15,057
Sheep	5,146
Hogs	18,869
Schools operated	80
Teachers	104
Pupils	6,087
Amount expended for schools, 1894	$29,064.64
Permanent school fund	26,273.75
Average annual precipitation	34 inches
Annual mean temperature	55 degrees

SHIPMENTS.

Cattle, cars	95	Flax seed	72	Poultry	135,932	Stone	143
Hogs	222	Hay	160	Eggs, doz	104,718	Iron ore	2
Horses and mules	13	Mixed grain	154	Butter, lbs	28,421	Lead ore and zinc	691
Mixed live-stock	69	Pelts, lbs.	607	Feathers	1,750	Coal	24
Bl'd hogs, head	14	Furs	562	Ties, cars	2	Other, cars	36
Wheat, cars	174	Flour	9,755,000	Wood	19	Miscel., lbs.	928,662
Oats	114	Game	9,880	Brick and sand	2		

DALLAS.

Area, taxable	266,557 acres
Population	12,647
Assessed valuation	$1,790,941
No. horses and mules	8,359
Cattle	18,529
Sheep	10,682
Hogs	18,779
No. schools operated	71
Teachers	70
Pupils	4,400
Amount expended for schools, 1894	$15,144.26
Permanent school fund	$21,736.10
Average annual precipitation	40 inches
Annual mean temperature	55 degrees

No railroad. Shipments probably go to Polk and Laclede counties.

DOUGLAS.

Area, taxable	364,348 acres
Population	14,111
Assessed valuation	$1,629,474
No. horses and mules	6,315
Cattle	16,195
Sheep	8,074
Hogs	22,789
No. schools in operation	90
Teachers	103
Pupils	6,061
Amount expended for schools, '94	$14,577.50
Permanent school fund	$15,662.09
Average annual precipitation	47 inches
Annual mean temperature	57 degrees

No railroad. Shipments probably made from Wright, Webster and Christian counties.

DAVIESS.

Area, taxable	357,715 acres
Land, per cent in cultivation	90
Principal agricultural products	Corn, grass, oats
Principal live-stock	cattle, hogs, horses
Topography	undulating
Population	20,456
Assessed valuation	$6,890,641
No. horses and mules	20,007
Cattle	34,050
No. sheep	16,492
Hogs	36,526
Schools operated	117
Teachers	137
Pupils	6,797
Amount expended for schools, '94	$45,800.65
Permanent school fund	82,721.63
Average annual precipitation	36 inches
Annual mean temperature	52 degrees

SHIPMENTS.

Cattle, cars	546	Oats	8	Eggs, doz	1,352,752	Logs	17
Hogs	546	Hay	30	Butter, lbs	141,910	Wood	100
Horses and mules	50	Wool, lbs	51,730	Cheese	12,720	Axe handles, doz	400
Sheep	59	Hides	101,575	Feathers	2,101	Posts, cars	2
Mixed live-stock	13	Flour	37,420	Timothy seed, bu	1,020	Brick	7
Bl'd cattle, head	2	Nursery stock	1,005	Millet seed	210	Junk	3
Hogs	44	Dried fruit	335	Beans, crates	134	Sand	1
Fancy dogs	37	Game	657	Apples, brls	1,123	Other	33
Fowls	65	Tallow	14,215	Potatoes	327	Miscel., lbs	654,964
Corn, cars	18	Poultry	1,088,704	Lumber, cars	2		

DEKALB.

Area, taxable	268,005 acres
Land, per cent in cultivation	100
Principal agricultural products	Corn, oats, wheat, grass
Principal live-stock	cattle, hogs, horses
Topography	rolling
Population	14,589
Assessed valuation	$4,746,482
No. horses and mules	11,533
Cattle	21,995
No. sheep	3,391
Hogs	18,963
Schools operated	82
Teachers	110
Pupils	4,802
Amount expended for schools, '94	$36,619.53
Permanent school fund	45,458.58
Average annual precipitation	36 inches
Annual mean temperature	51 degrees

SHIPMENTS.

Cattle, cars	405	Wool, lbs	11,683	Tallow	11,455	Molasses, gal	885,947
Hogs	550	Pelts	245	Poultry	178,093	Beer	95
Horses and mules	24	Hides	398,262	Eggs, doz	273,065	Whisky	50
Sheep	5	Flour	80,000	Butter, lbs	56,831	Cream	2,420
Mixed live-stock	51	Shipstuff	90,000	Cheese	94,797	Apples, brls	11,758
Bl'd horses, head	2	Corn-meal	1,575	Feathers	520	Potatoes	3,655
Cattle	2	Nursery stock	12,200	Onions, bu	31	Lumber, cars	1
Hogs	1	Beeswax	180	Timothy seed	385	Logs	12
Wheat, cars	220	Dried fruit	655	Millet seed	1,530	Wood	24
Corn	441	Beef	300	Cane, cars	2	Coke	1
Oats	17	Pork	1,440	Pea.s, crates	25	Other	13
Hay	17	Game	325	Grapes	15	Miscel., lbs	1,196,033
Straw	1						

DENT.

Area, taxable	461,326 acres
Land, per cent in cultivation	20
Principal agricultural products	Corn, wheat, oats, clover
Principal live-stock	Cattle, hogs, sheep, horses
Mineral	iron
Topography	undulating to broken
Population	12,149
Assessed valuation	$2,097,014
No. horses and mules	5,055
No. cattle	11,312
Sheep	11,363
Hogs	19,306
Schools operated	64
Teachers	74
Pupils	4,215
Amount expended for schools, '94	$13,560.31
Permanent school fund	23,308.53
Average annual precipitation	42 inches
Annual mean temperature	54 degrees

SHIPMENTS.

Cattle, cars	73	Pelts	1,200	Poultry	173,900	Logs	1
Hogs	16	Hides	29,630	Eggs, doz	116,340	Staves	1
Sheep	41	Flour	3,260	Butter, lbs	1,050	Hoops	2
Mixed live-stock	159	Shipstuff	87,100	Feathers	2,485	Iron ore	852
Wheat	48	Beeswax	245	Timothy seed, bu.	108	Pig-iron	164
Hay	1	Dried fruit	1,800	Potatoes, brls	1,230	Junk	1
Tobacco, lbs	3,500	Game	48,940	Lumber, cars	94	Charcoal	28
Wool	54,015	Tallow	2,300	Ties	466	Misc., lbs	69,388

DUNKLIN.

Area, taxable	247,218
Land, per cent in cultivation	25
Principal agricultural products	Cotton, corn, wheat and grass
Principal live-stock	hogs, horses
Topography	generally level
Population	15,085
Assessed valuation	$2,448,556
No. horses and mules	5,556
Cattle	12,422
No. sheep	759
Hogs	26,203
Schools operated	54
Teachers	66
Pupils	6,072
Amount expended for schools, 1894	$28,526 22
Permanent school fund	27,690.75
Average annual precipitation	46 inches
Annual mean temperature	58 degrees

SHIPMENTS.

Cattle, cars	31	Pelts	7,500	Poultry	79,462	Cotton, bales	11,128
Hogs	13	Hides	12,509	Eggs, doz	52,790	Lumber, cars	1,723
Mixed live-stock	158	Flour	2,310	Feathers, lbs	2,898	Ties	2
Bl'd horses, head	1	Shipstuff	3,000	Oil	13,400	Logs	74
Hogs	2	Beeswax	987	Onions, bu	300	Staves	162
Wheat, cars	2	Dried fruit	765	Cotton-seed products, lbs	3,899,610	Ice	3
Corn	16	Beef	295	Cotton seed	151,636	Junk	10
Hay	10	Pork	226	Strawberries, crates	3	Paving blocks	1
Mixed grain	12	Game	96,471	Beer, gal	8,479	Other	20
Melons	8	Fish	793,400	Whisky	94	Misc., lbs	819,751
Wool, lbs	763	Tallow	4,327				

FRANKLIN.

Area, taxable	533,578 acres
Land, per cent in cultivation	33
Principal agricultural products	Wheat, oats, corn
Principal live-stock	horses, mules, hogs
Minerals	lead, iron, tripoli
Topography	broken
Population	28,056
Assessed valuation	$7,073,220
No. horses	10,609
No. cattle	18,870
Sheep	8,146
Hogs	26,762
Schools operated	122
Teachers	136
Pupils	10,027
Amount expended for schools, '94	$50,231.09
Permanent school fund	78,116.07
Average annual precipitation	40 inches
Annual mean temperature	55 degrees

SHIPMENTS.

Cattle, cars	85	Corn-meal	17,353	Nuts, bu	101	Posts	1
Hogs	219	Nursery stock	35,352	Onions	45	Brick	20
Horses and mules	12	Dried fruit	16,771	Pop-corn	21	Stone	4
Sheep	30	Beef	250	Clover seed	4,637	Iron	5
Mixed live-stock	490	Pork	4,285	Fruit, lbs	380	Pig-lead	6
Calves	119	Veal	52,826	Molasses, gal	514	Slag	1
Bl'd sheep	41	Game	12,128	Wine	3,708	Ice	1
Hogs	4	Meat	25,245	Beer	43,716	Junk	3
Wheat	1,022	Provisions	140	Whisky	170	Clay	9
Corn	42	Lard	2,377	Potatoes, brls	398	Gravel	4,461
Corn-cobs	21	Tallow	37,246	Lumber, cars	171	Sand	1,140
Broom-corn	1	Poultry	554,251	Ties	439	Charcoal	258
Wool, lbs	42,273	Eggs, doz	946,596	Logs	4	Misc., lbs	4,453,543
Pelts	15,730	Butter, lbs	149,894	Wood	318	Musical inst., lbs	6,163
Hides	72,079	Cheese	102	Staves	18	Corn-cob pipes	402,232
Flour	11,863,046	Feathers	589	Hoops	31	Stoneware	7,460
Shipstuff	1,194,135						

GASCONADE.

Area, taxable	318,888 acres
Land, per cent in cultivation	50
Agricultural products	wheat, corn, clover
Principal live-stock	cattle, hogs, horses
Minerals developed	iron, kaolin
Topography	generally broken
Population	11,706
Assessed valuation	$3,611,739
No. horses and mules	5,730
Cattle	10,836
No. sheep	5,889
Hogs	15,118
Schools operated	58
Teachers	64
Pupils	4,248
Amount expended for schools, '94	$19,754.65
Permanent school fund	25,353,18
Average annual precipitation	38 inches
Annual mean temperature	55 degrees

SHIPMENTS.

Cattle, cars	9	Hides	71,222	Butter, lbs	8,528	Liquors	1,444
Hogs	117	Nursery stock	8,940	Feathers	1,443	Apples, brls	398
Horses and mules	2	Pork	845	Onions, bu	867	Potatoes	448
Sheep	1	Game	980	Clover seed	1,850	Hoops, cars	9
Mixed live-stock	54	Lard	6,551	Cucumbers, cars	6	Brick	12
Wheat	543	Tallow	20,106	Grapes, crates	3	Lime	1
Corn	36	Poultry	142,471	Wine, gal	137,758	Ice	1
Hay	1	Eggs, doz	387,080	Beer	23,817	Miscel., lbs	51,364
Tobacco, lbs	1,746						

GENTRY.

Area, taxable	310,225 acres
Land, per cent in cultivation	96
Principal agricultural products	Corn, wheat, rye, oats, grass
Principal live-stock	Cattle, horses, hogs, sheep
Topography	Some level bottom, rolling upland
Population	19,018
Assessed valuation	$5,686,057
No. horses and mules	15,272
No. cattle	28,943
Sheep	11,023
Hogs	23,799
Schools operated	87
Teachers	153
pupils	6,569
Amount expended for schools, 1894	$42,157.48
Permanent school fund	89,213.74
Average annual precipitation	34 inches
Annual mean temperature	50 degrees

SHIPMENTS.

Cattle, cars	680	Tobacco, lbs	1,900	Butter, lbs	96,108	Potatoes	13
Hogs	646	Wool	82,699	Cheese	8,460	Lumber, cars	2
Horses and mules	85	Pelts	130	Feathers	4,965	Piling	15
Sheep	34	Hides	92,705	Nuts, bu	135	Ties	50
Mixed live-stock	44	Flour	61,266	Timothy seed	76	Logs	24
Bl'd horses, head	10	Shipstuff	1,160	Clover seed	160	Wood	271
Cattle	22	Nursery stock	6,900	Millet seed	4,920	Staves	1
Sheep	12	Dried fruit	3,185	Cane seed	2,270	Saw-dust	19
Hogs	14	Beef	50	Beans, lbs	9,540	Posts	20
Wheat, cars	7	Pork	1,445	Molasses, gals	1,213	Brick	26
Corn	205	Game	100	Beer	1,509	Tiling	16
Oats	17	Lard	110	Whisky	128	Junk	26
Flax fiber	1	Tallow	24,700	Cider, cars	2	Sand	68
Broom-corn	1	Poultry	125,169	Apples, brls	3,523	Miscel., lbs	3,700,505
Hay	10	Eggs, doz	267,360				

GREENE.

Area, taxable	422,365 acres
Land, per cent in cultivation	85
Principal agricultural products	Clover, corn, wheat
Principal live-stock	cattle, hogs, horses
Minerals developed	lead, zinc
Topography	rolling to broken
Population	48,616
Assessed valuation	$14,762,964
No. horses and mules	18,416
No. cattle	21,264
Sheep	6,495
Hogs	27,980
Schools operated	129
Teachers	204
Pupils	15,780
Amount expended for schools, '94	$137,867.22
Permanent school fund	63,964.48
Average annual precipitation	43.7 inches
Annual mean temperature	55 degrees

SHIPMENTS.

Cattle, cars	183	Flour	47,700,148	Peas, crates	11	Wood	410
Hogs	368	Shipstuff	4,477,129	Tomatoes	99	Brick and sand	48
Horses and mules	58	Corn-meal	400	Vegetables, lbs	7,250	Stone	93
Sheep	19	Nursery stock	109,500	Raspberries, cr	215	Iron	5
Mixed live stock	192	Dried fruit	685	Blackberries	15	Lead ore & zinc	106
Bl'd cattle, head	3	Veal	2,000	Strawberries	7,625	Zinc ore	4
Wheat, cars	494	Game	32,052	Fruit, lbs	35,960	Coal	5
Corn	513	Fish	6,980	Beer, gal	1,176	Lime & cement	3,223
Oats	65	Tallow	100,060	Vinegar	6,550	Tar	3
Hay	76	Poultry	1,722,329	Apples, brls	454	Ice	15
Melons	2	Eggs, doz	1,005,556	Potatoes	485	Junk	6
Wool, lbs	14,067	Butter, lbs	11,225	Cotton, bales	442	Coke and coal	6
Pelts	400	Feathers	18,542	Lumber, cars	19	Other	1,029
Hides	507,491	Canned goods	384,500	Ties	5	Miscel., lbs	27,690,737

GRUNDY.

Area, taxable	272,990 acres
Land, per cent in cultivation	96
Principal agricultural products	Corn, small grain, grass
Principal live-stock	hogs, cattle
Mineral developed	coal
Topography	undulating
Population	17,876
Assessed valuation	$5,440,596
No. horses and mules	11,644
No. cattle	25,095
Sheep	13,615
Hogs	11,437
Schools operated	87
Teachers	139
Pupils	5,898
Amount expended for schools, '94.	$42,997.30
Permanent school fund	77,351.58
Average annual precipitation	37 inches
Annual mean temperature	53 degrees

SHIPMENTS.

Cattle, cars	253	Oats	10
Hogs	219	Barley	20
Horses and mules	11	Hay	19
Sheep	38	Furs, lbs	562
Mixed live-stock	2	Wool	38,735
Bl'd horses, head	4	Pelts	1,515
Cattle	3	Hides	23,105
Dogs	18	Flour	30,210
Hogs	465	Shipstuff	41,000
Fancy chickens	96	Nursery stock	600
Wheat, cars	6	Beef	4,250
Corn	9	Pork	2,275
Game	1,229	Wine, liquors and beer, lbs	121,390
Poultry	307,239	Apples, brls	460
Eggs, doz	173,154	Lumber, cars	29
Butter, lbs	8,502	Wood	3
Feathers	2,593	Hoops	3
Dairy products	29,633	Brick	1
Nuts, bu	35	Lime	7
Timothy seed	230	Ice	300
Fruit and vegetables, lbs	31,910	Junk	4
Forest products	238,110	Misc., lbs	1,139,272
Molasses, gal	50		

HARRISON.

Area, taxable	456,441 acres
Land, per cent in cultivation	97
Principal agricultural products	Corn, wheat, oats, grass
Principal live-stock	Cattle, hogs, horses, sheep
Topography	level to undulating
Population	21,033
Assessed valuation	$7,181,941
No. horses and mules	23,505
No. cattle	44,738
Sheep	11,154
Hogs	28,487
Schools operated	158
Teachers	158
Pupils	7,535
Amount expended for schools, '94.	$52,888.49
Permanent school fund	98,946.43
Average annual precipitation	34.8 inches
Annual mean temperature	50 degrees

SHIPMENTS.

Cattle, cars	560	Oats	12
Hogs	422	Rye	2
Horses and mules	37	Hay	14
Sheep	31	Straw	1
Mixed live-stock	11	Wool, lbs	16,203
Bl'ded hogs, head	6	Pelts	745
Corn, cars	99		
Hides	29,740	Apples, brls	1,752
Game	1,080	Lumber, cars	5
Poultry	529,186	Hoops	7
Eggs, doz	223,180	Posts	1
Butter, lbs	61,475	Brick	2
Feathers	130	Junk	1

HENRY.

Area, taxable	458,031 acres
Land, per cent in cultivation	87
Principal live-stock	horses, cattle, hogs
Principal agricultural products	Corn, wheat, oats, flax
Minerals developed	coal, iron, clay
Topography	undulating to level
Population	28,235
Assessed valuation	$9,066,024
No. horses and mules	17,092
No. cattle	23,815
Sheep	2,972
Hogs	20,622
Schools operated	111
Teachers	168
Pupils	9,734
Amount expended for schools, '94	$65,943.67
Permanent school fund	57,926.79
Average annual precipitation	35.8 inches
Annual mean temperature	55 degrees

SHIPMENTS.

Cattle, cars	770	Tobacco, lbs	920	Butter, lbs	13,632	Wood	74
Hogs	587	Wool	1,000	Cheese	9,400	Brick and sand	55
Horses and mules	32	Pelts	2,800	Feathers	723	Stone	8
Sheep	19	Hides	161,889	Timothy seed, bu	2,611	Coal	1,771
Mixed live-stock	50	Flour	64,774,010	Clover seed	87	Lime	2
Bl'd horses, head	6	Shipstuff	898,000	Beans, crates	500	Pottery and sewer pipe	1,703
Hogs	14	Corn meal	1,351,000	Tomatoes	4		
Wheat, cars	305	Nursery stock	50,000	Sweet corn	7	Tar	3
Corn	1,093	Castor beans	45,000	Peaches	12	Ice	5
Oats	203	Dried fruit	750	Molasses, gal	2,816	Junk	6
Cane seed	2	Game	1,629	Apples, brls	1,440	Clay	61
Flax seed	136	Tallow	8,800	Potatoes	1,064	Paving blocks	6,203
Broom-corn	156	Grease	435	Lumber, cars	29	Other	153
Hay	484	Poultry	1,872,906	Ties	5	Miscel., lbs	9,168,924
Mixed grain	15	Eggs, doz	1,111,656	Logs	2		

HICKORY.

Area, taxable	235,453 acres
Population	9,453
Assessed valuation	$1,676,424
No. horses and mules	7,763
Cattle	13,472
Sheep	6,342
Hogs	14,472
No. schools operated	60
Teachers	64
Pupils	3,456
Amount expended for schools, 1894	$12,122.75
Permanent school fund	24,955.03
Average annual precipitation	40 inches
Annual mean temperature	55 degrees

No railroad. Shipments made from St. Clair and Polk counties.

HOLT.

Area, taxable	279,196 acres
Land, per cent in cltivation	.82
Principal agricultural products	Corn, wheat, grass
Principal live-stock	cattle
Topography	level bottom, rolling upland
Population	15,469
Assessed valuation	6,171,757
No. horses and mules	12,443
Cattle	17,041
No. sheep	1,443
Hogs	27,213
Schools operated	75
Teachers	99
Pupils	5,330
Amount expended for schools, 1894	$42,864.48
Permanent school fund	107.057.96
Average annual precipitation	35.7 inches
Annual mean temperature	51.4 degrees

SHIPMENTS.

Cattle, cars	827	Corn	979	Poultry	65,497	Apples, brls	58,952
Hogs	549	Oats	13	Eggs, doz	4,935	Lumber, cars	25
Horses and mules	13	Hay and straw	54	Butter, lbs	2,866	Ties and wood	295
Sheep	17	Mixed grain	4	Feathers	2,196	Brick	6
Bl'd jack, head	1	Hides, lbs	383	Plums, crates	394	Other	4
Hogs	12	Flour	1,740,000	Raspberries	9	Miscel., lbs	3,533,834
Wheat, cars	200	Game	501	Blackberries	134		

HOWARD.

Area, taxable	286,514 acres
Land, per cent cultivated	95
Principal agricultural products	Corn, wheat, oats, grass, tobacco, fruit
Principal live-stock	Cattle, hogs, mules, horses
Mineral	coal
Topography	undulating
Population	17,371
Assessed valuation	$6,262,974
No. horses and mules	10,993
No. cattle	16,139
Sheep	12,450
Hogs	17,670
Schools operated	79
Teachers	193
Pupils	5,632
Amount expended for schools, '94	$39,408.51
Permanent school fund	32,051.91
Average annual precipitation	35 inches
Annual mean temperature	54.3 degrees

SHIPMENTS.

Cattle, cars	277	Pelts	2,158	Butter, lbs	4,515	Grapes	36
Hogs	361	Hides	45,163	Feathers	1,318	Apples, brls	5,515
Horses and mules	34	Flour	473,100	Nuts, bu	61	Potatoes	4,053
Sheep	40	Shipstuff	32,000	Timothy seed	700	Lumber, cars	5
Mixed live-stock	11	Corn-meal	8,000	Clover seed	500	Ties	57
Bl'd horses, head	6	Castor beans	2,266	Beans, crates	50	Logs	2
Hogs	41	Dried fruit	2,050	Tomatoes	265	Wood	8
Wheat, cars	248	Game	200	Squashes and turnips, cars	3	Hoops	21
Corn	24	Fish	705	Cabbage	2	Junk	1
Oats	2	Tallow	2,345	Plums, crates	1	Sand	5
Hay	2	Poultry	297,344	Strawberries	159	Other	10
Tobacco, lbs	35,145	Eggs, doz	20,950			Miscel., lbs	1,378,793
Wool	79,688						

No report of shipments from Glasgow over the Wabash railroad.

HOWELL.

Area, taxable	479,192 acres
Land, per cent cultivated	22
Agricultural products	Wheat, corn, oats, fruit
Mineral, developed	iron
Topography	undulating to broken
Population	18,618
Assessed valuation	$3,718,349
No. horses and mules	7,026
Cattle	15,117
No. sheep	9,048
Hogs	31,548
Schools operated	96
Teachers	115
Pupils	7,561
Amount expended for schools, '94	$33,485.02
Permanent school fund	25,340.69
Average annual precipitation	48 inches
Annual mean temperature	57 degrees

SHIPMENTS.

Cattle, cars	168	Corn	2	Cotton, bales	2,520	Iron	2
Hogs	118	Hay	29	Lumber, cars	843	Other	227
Horses and mules	31	Flour, lbs	870,000	Ties	107	Misc., lbs	2,528,000
Wheat	51	Apples, brls	192	Brick and sand	28		

IRON.

Area, taxable	321,552 acres
Land, per cent cultivated	33⅓
Principal agricultural products	Wheat, corn, oats, fruit
Principal live-stock	hogs, cattle, mules
Minerals	iron, lead, zinc, kaolin, granite
Topography	rolling and broken
Population	9,119
Assessed valuation	$2,610,342
No. horses and mules	2,441
No. cattle	6,961
Sheep	1,974
Hogs	7,320
Schools operated	43
Teachers	50
Pupils	2,857
Amount expended for schools, '94	$14,105.86
Permanent school fund	27,506.97
Average annual precipitation	45.2 inches
Annual mean temperature	54 degrees

SHIPMENTS.

Cattle, cars	53	Hides	27,348	Butter, lbs	2,616	Hoops	31
Hogs	33	Flour	1,771,650	Grapes, crates	58	Posts	1
Horses and mules	1	Dried fruit	2,920	Soda water, gal	819	Stone	22
Sheep	6	Beef	612	Beer	918	Granite	149
Mixed live-stock	56	Pork	1,450	Whisky	119	Iron	1
Bl'd sheep, head	2	Veal	100	Oil, lbs	80,000	Iron ore	1
Hogs	9	Game	11,557	Lumber, cars	1,104	Granite spalls	379
Corn, cars	2	Provisions	6,135	Piling	134	Paving blocks	63
Hay	4	Tallow	8,593	Ties	62	Other	31
Wool, lbs	3,274	Poultry	29,318	Wood	5	Miscel., lbs	55,666
Furs	869	Eggs, doz	20,513				

JACKSON.

Area, taxable	363,124 acres
Land, per cent in cultivation	90
Principal agricultural products	Corn, wheat, oats, rye, grass
Principal live-stock	cattle, hogs
Minerals developed	coal
Topography	undulating
Population	160,510
Assessed valuation	$79,540,544
No. horses and mules	25,475
No. cattle	28,860
Sheep	12,578
Hogs	27,046
Schools in operation	129
Teachers	191
Pupils	52,221
Amount expended for schools, '94	$546,799.80
Permanent school fund	202,111.14
Average annual precipitation	35.8 inches
Annual mean temperature	53.9 degrees

SHIPMENTS.

Cattle, cars	708	Wool	7,588	Cheese	275	Milk	58,340
Hogs	436	Pelts	269	Dairy products	1,200	Apples, brls	26,529
Horses and mules	52	Hides	6,147	Onions, bu	471	Potatoes	977
Sheep	66	Flour	23,197,235	Pop-corn	190	Lumber, cars	214
Mixed live-stock	291	Shipstuff	470,000	Timothy seed	4,820	Logs	1
Bl'd cattle, head	1	Buckwheat	2,120	Clover seed	183	Wood	170
Sheep	10	Honey	400	Sorghum seed	340	Staves	5
Hogs	50	Dried fruit	253,735	Vegetables, lbs.	190,000	Cooperage	50
Wheat, cars	450	Beef	558	Tomatoes, crates	80	Brick, tiling, stone	247
Corn	538	Pork	725	" lbs	825	Coal	6
Oats	44	Veal	2,560	Plums, crates	35	Junk	16
Barley	2	Game	820	Raspberries	8	Clay	45
Rye	6	Provisions	20,000	Blackberries	385	Charcoal	2
Hay	259	Tallow	2,500	Strawberries	15	Other	111
Straw	32	Poultry	185,944	Gooseberries	4	Miscel., lbs	832,168
Mixed grain	11	Eggs, doz	33,635	Grapes	3	Woolens	29,415
Furs, lbs	742	Butter, lbs	10,206	Cider, gal	394		

JEFFERSON.

Area, taxable	407,099 acres
Land, per cent in cultivation	50
Principal agricultural products	Corn, wheat, oats
Principal live-stock	horses, cattle
Minerals developed	lead, zinc, kaolin
Topography	undulating to broken
Population	22,484
Assessed valuation	$4,943,637
No. horses and mules	8,434
No. cattle	15,070
Sheep	8,437
Hogs	18,574
Schools operated	88
Teachers	111
Pupils	8,131
Amount expended for schools, 1894	$29,899.43
Permanent school fund	55,772.37
Average annual precipitation	42 inches
Mean annual temperature	55.1 degrees

SHIPMENTS.

Cattle, cars	59	Shipstuff	2,500	Grapes	141	Slag	5
Hogs	52	Nursery stock	300	Beer, gals	101,500	Lime	717
Sheep	1	Beef	420	Cream	80	Cement	26
Mixed live-stock	8	Pork	3,116	Oil, tons	863	Tiff	1
Calves, head	223	Veal	8,000	Milk, gals	127,530	Ice	8
Blooded calf	1	Lamb	6,235	S. potatoes, lbs.	9,470	White sand	362
Sheep	5	Provisions	1,015	Lumber, cars	204	Clay	61
Hogs	6	Fish	31,944	Wood	297	Glass	322
Wheat, cars	44	Tallow	882	Staves	4	Sand	33
Oats	1	Poultry	13,065	Cooperage	4	Charcoal	1
Hay	2	Eggs, doz	7,885	Brick	115	Coke	10
Wool, lbs	4,506	Butter, lbs	6,881	Stone	83	Other	1,668
Pelts	412	Tomatoes & sweet corn, crates	450	Gravel	233	Miscel., lbs	274,835
Hides	76,008	Strawberries	19	Iron	20	Feed, tons	63
Flour	3,511,106			Pig-lead	1,374		

JASPER.

Area, taxable	401,749 acres
Land, per cent in cultivation	80
Principal agricultural products	Wheat, corn, grass, oats
Principal live-stock	cattle, hogs, horses
Minerals developed	lead, zinc
Topography	rolling and broken
Population	50,500
Assessed valuation	$12,537,145
No. horses and mules	18,068
No. cattle	19,082
Sheep	3,092
Hogs	12,294
Schools operated	123
Teachers	271
Pupils	16,242
Amount expended for schools	$143,031.06
Permanent school fund	230,010.37
Average annual precipitation	39.4 inches
Annual mean temperature	56 degrees

SHIPMENTS.

Cattle, cars	123	Dried fruit	2,920	Cabbage	22,640	White-lead	2
Hogs	97	Beef	320	Vegetables	99,000	Pitch	1
Horses and mules	23	Pork	3,568	Radishes	2,050	Lead	86
Sheep	6	Veal	3,920	Raspberries,crates	100	Iron	1
Mixed live-stock	47	Game	20,724	Strawberries	7,786	Gravel	104
Bl'd horses, head	8	Provisions	20,500	Fruit, lbs	20,438	Pig-lead	856
Sheep	10	Meat	22,100	Molasses, gal	236	Lead ore	868
Hogs	23	Lard	57,891	Beer	27,925	Zinc	1,440
Wheat, cars	1,065	Tallow	97,650	Whisky	3,978	Slag	3
Corn	138	Poultry	201,780	Apples, brls	142	Coal	2
Oats	62	Eggs, doz	74,144	Potatoes	1,100	Lime	701
Flax seed	38	Butter, lbs	54,868	Spuds, lbs	22,100	Pottery	13
Hay	261	Cheese	620	Lumber, cars	108	Tar	6
Straw	3	Feathers	6,691	Ties	20	Ice	261
Melons, lbs	1,000	Nuts, bu	68	Logs	5	Junk	37
Tobacco	3,000	Onions	243	Wood	69	Fire-clay	4
Wool	2,270	Timothy seed	500	Staves	651	Zinc ore	2,089
Hides	360,167	Grass seed	1,111	Cooperage	37	Sand	49
Flour	52,040,015	Garden seed	301	Telegraph poles	4	Ballast	5,199
Shipstuff	6,941,000	Beans, crates	521	Posts	8	Coke	20
Corn-meal	100,000	Canned goods,cars	29	Ore	626	Other	184
Nursery stock	71,338	Lettuce, lbs	2,050	Brick	146	Misc., lbs	8,305,093
Honey	300						

JOHNSON

Area, taxable	517,831 acres
Land, per cent in cultivation	75
Principal agricultural prodcucts	Corn, wheat, oats, grass
Principal live-stock	Horses, cattle, hogs, sheep
Minerals developed	coal
Topography	undulating
Population	28,132
Assessed valuation	$9,954,606
No. horses and mules	19,714
No. cattle	24,038
Sheep	6,171
Hogs	28,256
Schools operated	148
Teachers	216
Pupils	9,091
Amount expended for schools, 1894	$63,851.74
Permanent school fund	106,857.04
Average annual precipitation	34.6 inches
Annual mean temperature	53.6 degrees

SHIPMENTS.

Cattle, cars	215	Straw	2	Butter, lbs	17,171	Ties	1
Hogs	278	Wool, lbs	10,780	Dairy products	3,290	Logs	5
Horses and mules	6	Pelts	3,065	Feathers	1,240	Wood	3
Sheep	53	Hides	21,146	Timothy seed, bu	500	Brick	4
Mixed live-stock	35	Flour	810,878	Sorghum seed	500	Tiling	5
Bl'd hogs, head	74	Shipstuff	120,000	Blackberries, crates	43	Coal	88
Wheat, cars	334	Dried fruit	39	Molasses, gals	4,861	Junk	12
Corn	386	Game	327	Wine	100	Other cars	2
Oats	24	Tallow	14,935	Apples, brls	1,446	Miscel., lbs	82,162
Flax seed	21	Poultry	544,710	Potatoes	40	Stove-polish	49,550
Broom-corn	1	Eggs, doz	155,573	Lumber, cars	11	Brooms	7,430
Hay	67						

No freight report from Warrensburg.

KNOX.

Area, taxable	319,302 acres
Land, per cent in cultivation	92
Principal agricultural products	Corn, wheat, grass, fruit
Principal live-stock	cattle, hogs
Topography	undulating
Population	13,501
Assessed valuation	$4,105,614
No horses and mules	11,020
Cattle	21,000
No. sheep	7,219
Hogs	16,852
Schools operated	82
Teachers	111
Pupils	3,905
Amount expended for schools, '94	$21,489.21
Permanent school fund	54,360.41
Average annual precipitation	30.2 inches
Annual mean temperature	50 degrees

SHIPMENTS.

Cattle, cars	230	Wool, lbs	27,595	Poultry	366,860	Apples, brls	371
Hogs	276	Pelts	1,567	Eggs, doz	226,204	Lumber, cars	16
Horses and mules	26	Hides	248,084	Butter, lbs	13,291	Ties	22
Sheep	19	Flour	13,150	Feathers	6,317	Wood	2
Mixed live-stock	265	Shipstuff	72,050	Nuts, bu	150	Hoops	23
Wheat	3	Nursery stock	63,200	Timothy seed	11,263	Brick	5
Corn	8	Beef	510	Hungarian seed	2,000	Junk	5
Oats	59	Veal	320	Millet seed	1,500	Other	13
Hay	85	Tallow	8,415	Molasses, gal.	50	Misc., lbs	819,069

LAFAYETTE.

Area, taxable	390,329 acres
Land, per cent in cultivation	90
Principal agricultural products	wheat, corn, oats, grass, hemp
Principal live-stock	cattle, hogs, mules
Mineral developed	coal
Topography	rolling to broken
Population	30,184
Assessed valuation	$10,823,705
No. horses and mules	17,969
No. cattle	23,882
Sheep	5,458
Hogs	23,998
Schools operated	111
Teachers	174
Pupils	10,042
Amount expended for schools, '94	$70,468.79
Permanent school fund	110,586.60
Average annual precipitation	35 inches
Annual mean temperature	51.6 degrees

SHIPMENTS.

Cattle, cars	650	Pelts	177	Eggs, doz	80,715	Potatoes	1,472
Hogs	909	Hides	14,973	Butter, lbs	161,032	Lumber, cars	94
Horses and mules	84	Flour	31,254,452	Feathers	75	Logs	5
Sheep	32	Shipstuff	3,360,185	Clover seed, bu	1,964	Wood	66
Mixed live-stock	58	Corn meal	120,000	Hungarian seed	334	Brick	74
Bl'd cattle, head	2	Dried fruit	84,522	Grass seed	1,642	Tiling	11
Sheep	3	Beef	2,117	Beans, lbs	560	Coal	9,593
Hogs	133	Pork	3,487	Canned goods, cars	14	Lime	1
Wheat, cars	1,032	Veal	780	Vegetables, lbs	240,000	Tar	5
Corn	795	Game	674	Can tomatoes	657,000	Junk	7
Oats	17	Provisions	1,174,207	Plums, crates	302	Sand	3
Barley	11	Meat	1,645	Raspberries	21	Coke	4
Rye	2	Fish	1,615	Blackberries	110	Other	261
Corn cobs	1	Lard	2,465	Beer, gal.	2,180	Miscel., lbs	4,493,285
Hay	77	Tallow	2,000	Cider, cars	2	Bee-hives	25,790
Mixed grain	10	Poultry	482,934	Apples, brls	48,196	Brooms	1,100
Wool, lbs	7,464						

LACLEDE.

Area, taxable	400,978 acres	No. cattle	15,699
Land, per cent in cultivation	45	Sheep	9,538
Principal agricultural products	Corn, wheat, grass, fruit	Hogs	21,097
		Schools operated	90
Principal live-stock	cattle, hogs, sheep	Teachers	104
Minerals developed	iron, lead	Pupils	5,820
Topography	broken	Amount expended for schools, '94	$18,470.61
Population	14,701	Permanent school fund	$31,660
Assessed valuation	$2,967,186	Average annual precipitation	41.4 inches
No. horses	7,536	Annual mean temperature	56 degrees

SHIPMENTS.

Cattle, cars	194	Tobacco, lbs	620	Poultry	631,475	Logs	3
Hogs	41	Wool	50,927	Eggs, doz	211,050	Wood	3
Horses and mules	20	Pelts	15,000	Butter, lbs	3,907	Brick	5
Sheep	29	Hides	44,506	Feathers	4,604	Junk	1
Mixed live-stock	168	Flour	1,119,293	Potatoes, brls	7,770	Sand	3
Wheat	72	Veal	500	Lumber, cars	6	Miscel., lbs	99,815
Hay	1	Game	132,784	Ties	105		

LAWRENCE.

Area	387,151 acres	No. cattle	15,726
Land, per cent in cultivation	78	Sheep	3,206
Principal agricultural products	Wheat, corn, oats, grass	Hogs	18,796
		Schools operated	99
Principal live-stock	cattle, hogs, mules	Teachers	168
Minerals developed	zinc, lead, silica	Pupils	9,659
Topography	rolling to broken	Amount expended for schools, 1894	$54,092.86
Population	26,228	Permanent school fund	42,221.98
Assessed valuation	$5,645,420	Average annual precipitation	56 inches
No. horses and mules	14,354	Annual mean temperature	44 degrees

SHIPMENTS.

Cattle, cars	87	Mixed grain	566	Tallow	15,535	Lumber, cars	2
Hogs	62	Melons	2	Poultry	470,155	Wood	2
Horses and mules	8	Tobacco, lbs	800	Eggs, doz	241,695	Brick	9
Sheep	8	Wool	7,380	Butter, lbs	5,032	Lead ore	241
Mixed live-stock	270	Pelts	880	Feathers	2,038	Zinc	890
Bl'd horse, head	1	Hides	68,313	Onions, bu	2,007	Lime	211
Cattle	1	Flour	13,364,186	Timothy seed	240	Tar	9
Hogs	4	Shipstuff	892,200	Clover seed	2,320	Ice	9,150
Wheat, cars	446	Corn-meal	13,140	Molasses, gals	150	Junk	1
Corn	7	Bran	703,500	Beer	708	Sand	99
Oats	18	Fruit	14,218	Whisky	4,072	Gravel	24
Flax seed	9	Veal	5,593	Apples, brls	14	Other	4
Hay	10	Game	30,545	Potatoes	84,616	Miscel., lbs	127,738

LEWIS.

Area, taxable	319,345 acres
Land, per cent in cultivation	92
Principal agricultural products	Corn, wheat, oats, grass
Principal live-stock	Hogs, cattle, horses, sheep
Topography	Rolling timber land, undulating prairie
Population	15,935
Assessed valuation	$5,129,887
No. horses and mules	12,483
No. cattle	17,062
Sheep	11,525
Hogs	18,051
Schools operated	83
Teachers	110
Pupils	4,984
Amount expended for schools, '94	$27,536.11
Permanent school fund	53,738.12
Average annual precipitation	34 inches
Annual mean temperature	50 degrees

SHIPMENTS.

Cattle, cars	264	Hay, cars	411	Veal	11,464	Piling	1
Hogs	428	Tobacco, lbs	11,015	Fish	32,990	Ties	286
Horses and mules	450	Wool	62,515	Poultry	520,350	Wood	106
Sheep	90	Pelts	1,520	Eggs, doz	190,375	Hoops	30
Mixed live-stock	4	Hides	43,464	Butter, lbs	12,510	Posts	6
Bl'd horses, head	3	Flour	34,580	Feathers	366	Stone	2
Hogs	64	Fur	538	Timothy seed, bu.	1,110	Junk	2
Wheat, cars	93	Corn-meal	8,350	Molasses, gal	104	Charcoal	1
Corn	39	Bran, cars	18	Milk	100	Other	3
Oats	80	Beef, lbs	520	Apples, brls	20	Misc., lbs	3,548,793
Other agricultural products, lbs.	912,680	Pork	740	Lumber, cars	383		

LINCOLN.

Area, taxable	390,812 acres
Land, per cent in cultivation	80
Principal agricultural products	Corn, wheat, grass
Principal live-stock	cattle, hogs, horses
Minerals developed	coal
Topography	western half, undulating prairie; eastern, broken
Population	18,343
Assessed valuation	$5,307,311
No. horses and mules	10,454
No. cattle	18,021
Sheep	9,806
Hogs	21,047
Schools operated	93
Teachers	106
Pupils	5,801
Amount expended for schools, '94	$30,285.32
Permanent school fund	38,376.17
Average annual precipitation	33.5 inches
Annual mean temperature	53 degrees

SHIPMENTS.

Cattle, cars	137	Hay and straw	67	Veal	1,310	Piling	4
Hogs	306	Mixed grain	10	Game	2,240	Ties	133
Horses and mules	23	Tobacco, lbs	250	Fish	106,908	Logs	11
Sheep	28	Wool	22,470	Tallow	865	Wood	174
Mixed live-stock	153	Pelts	5,716	Poultry	308,275	Staves	5
Bl'd hogs, head	51	Hides	25,903	Eggs, doz	626,410	Hoops	27
Wheat, cars	843	Flour	105,860	Butter, lbs	16,045	Tiling	1
Corn	89	Shipstuff	90,800	Feathers	2,072	Lime	96
Oats	32	Corn-meal	27,575	Nuts, bu	12	Junk	6
Flax seed	1	Dried fruit	3,000	Apples, brls	303	Other	2
Broom-corn	2	Pork	1,550	Lumber, cars	16	Misc., lbs	775,488

LINN.

Area, taxable.....383,574 acres	No. cattle.....32,218
Land, per cent in cultivation 95	Sheep.....9,144
Principal agricultural products.....	Hogs.....14,549
Corn, wheat, oats, grass, tobacco	Schools operated.....115
Principal live-stock.....cattle, hogs	Teachers.....160
Minerals developed.....coal	Pupils 7,825
Topography .....undulating	Amount expended for schools, '94 ..$56,794.84
Population.....24,121	Permanent school fund 66,263.86
Assessed valuation $6,698,044	Average annual precipitation .....37 inches
No. horses and mules 15,052	Annual mean temperature.....53 degrees

SHIPMENTS.

Cattle, cars..... 672	Hay..... 29	Poultry..... 613,416	Lumber, cars..... 47
Hogs..... 342	Furs, lbs 297	Eggs, doz..... 80,486	Hoops 8
Horses and mules.. 64	Pelts..... 543	Butter, lbs..... 15.552	Brick 8
Sheep 34	Hides 8,000	Feathers..... 1,315	Coal 364
Mixed live-stock .. 253	Flour 40,000	Asparagus 640	Junk..... 5
Bl'd cattle, head ... 1	Veal 455	Strawberries, cr ... 26	Other..... 20
Hogs.... 7	Game 757	Apples, brls..... 7,350	Miscel., lbs. .. 828,326
Corn, cars 54			

LIVINGSTON.

Area, taxable ....331,456 acres	No. cattle.....25,098
Land, per cent in cultivation.....97	Sheep.....14,209
Principal agricultural products.....	Hogs. 22,320
Corn, wheat, oats, grass, fruit	Schools operated.....98
Principal live-stock.....cattle, hogs	School teachers 127
Minerals developed..... .....coal	Pupils 6,784
Topography ....rolling	Amount expended for schools, 1894..$50,498.98
Population..... 20,668	Permanent school fund 139,545.00
Assessed valuation $6,425,870	Average annual precipitation.....37 inches
No. horses and mules ... .14,626	Annual mean temperature .....54.9 degrees

SHIPMENTS.

Cattle, cars..... 308	Wool..... ... 131,771	Feathers..... 130	Other forest pro-
Hogs..... 472	Pelts..... 5,123	Dairy products.. 6,780	ducts, lbs ... 212,100
Horses and mules.. 59	Hides..... 9,885	Timothy seed, bu. 3,631	Wood, cars 6
Sheep. 32	Flour..... 860,340	Millet seed... 3,844	Staves..... 3
Mixed live-stock ... 7	Shipstuff..... 52,160	Fruit & vegetables	Saw-dust..... 14
Bl'd sheep, head 7	Nursery stock .. 17,560	lbs 1,991,845	Brick 7
Hogs..... ... 40	Beef 210	Strawberries, cra.. 558	Stone 125
Wheat, cars..... 3	Game..... 4,898	Wine, liquor and	Coal 1
Corn 130	Fish 445	beer, gals. 33,286	Junk..... 7
Oats 35	Poultry..... 299,104	Cream..... 140	Sand and gravel.... 52
Hay..... 55	Eggs, doz 588,479	Apples, brls..... 18,447	Other..... 151
Mixed grain 5	Butter, lbs..... 13,113	Lumber, cars..... 40	Miscel., lbs 979,472
Tobacco, lbs..... 2,176			

McDONALD.

Area, taxable	277,185 acres
Land, per cent in cultivation	25
Principal agricultural products	Corn, wheat, clover, timothy
Principal live-stock	Horses, cattle, hogs, sheep
Topography	rolling, broken
Population	11,283
Assessed valuation	$1,667,634
No. horses and mules	6,163
No. cattle	11,049
Sheep	5,933
Hogs	19,386
Schools operated	65
Teachers	72
Pupils	4,589
Amount expended for schools, '94	$14,672.15
Permanent school fund	18,582.82
Average annual precipitation	46 inches
Annual mean temperature	58 degrees

SHIPMENTS.

Cattle, cars	27	Wool	4,805	Poultry	29,795	Saw-dust	1
Hogs	53	Pelts	100	Eggs, doz	75,082	Posts	69
Sheep	10	Hides	12,740	Onions, bu	1,750	Stone	173
Mixed live-stock	3	Flour	405,780	Lumber, cars	123	Coal	1
Bl'd hogs, head	4	Shipstuff	101,050	Piling	6	Junk	1
Wheat, cars	135	Corn-meal	30,555	Ties	352	Sand	34
Corn	1	Nursery stock	535	Logs	46	Other	53
Oats	1	Tallow	1,100	Wood	73	Miscel., lbs	270,552
Tobacco, lbs	85						

MACON.

Area, taxable	517,062 acres
Land, per cent in cultivation	87
Principal agricultural products	Oats, corn, grass, fruit
Principal live-stock	cattle, hogs, sheep
Minerals developed	coal
Topography	Level prairie, undulating timber land
Population	30,575
Assessed valuation	$9,003,396
No. horses and mules	23,429
No. cattle	34,291
Sheep	12,946
Hogs	27,187
Schools operated	140
Teachers	205
Pupils	10,267
Amount expended for schools, '94	$58,405.75
Permanent school fund	100,367.83
Average annual precipitation	35.5 inches
Annual mean temperature	51 degrees

SHIPMENTS.

Cattle, cars	168	Tobacco, lbs	3,587	Tallow	4,720	Apples, brls.	6,106
Hogs	290	Wool	70,523	Grease	350	Potatoes	132
Horses and mules	54	Pelts	244	Poultry	1,100,742	Ties, cars	21
Sheep	50	Furs	456	Eggs, doz	165,425	Logs	6
Mixed live-stock	392	Hides	106,620	Butter, lbs	48,895	Wood	1
Bl'd horses, head	30	Flour	501,084	Feathers	30,370	Hoops	42
Cattle	1	Shipstuff	20,000	Timothy seed, bu.	180	Posts	1
Hogs	72	Corn-meal	100	Hungarian seed	276	Stone	2
Wheat, cars	9	Nursery stock	300	Millet seed	57	Coal	14,068
Corn	9	Honey	100	Beans, lbs	1,070	Junk	7
Oats	13	Dried fruit	985	Tomatoes, crates	10	Other	4
Hay	84	Veal	1,870	Molasses, gal	400	Misc., lbs	1,761,124
Straw	9	Game	4,986	Milk	110		

MADISON.

Area, taxable	278,774 acres
Land, per cent in cultivation	50
Principal agricultural products	Corn, wheat, oats, grass
Principal live-stock	Cattle, hogs, horses, sheep
Minerals developed	lead, nickel
Topography	broken
Population	9,286
Asessed valuation	$1,762,805
No. horses and mules	3,462
No. cattle	6,693
Sheep	5,439
Hogs	10,713
Schools operated	48
Teachers	55
Pupils	3,365
Amount expended for schools, '94	$10,026.45
Permanent school fund	$13,397.13
Average annual precipitation	42.6 inches
Annual mean temperature	55 degrees

SHIPMENTS.

Cattle, cars	117	Mixed grain	2	Poultry	275,357	Granite	1
Hogs	24	Wool, lbs	6,680	Eggs, doz	84,650	Iron	3
Horses and mules	2	Pelts	2,250	Feathers	2,080	Lead	183
Sheep	20	Hides	31,500	Clover seed	167	Junk	5
Mixed live-stock	26	Flour	8,620,000	Beer, gal	6,490	Paving blocks	8
Bl'd cattle	8	Shipstuff	40,000	Whisky	125	Charcoal	8
Hogs	15	Beeswax	150	Lumber, cars	404	Other	21
Corn, cars	1	Veal	400	Ties	150	Miscel., lbs	914,119
Hay	15	Game	9,000	Stone	2		

MARIES.

Area, taxable	327,209 acres
Population	8,600
Assessed valuation	$1,551,682
No. horses and mules	5,839
Cattle	13,074
Sheep	10,555
Hogs	20,419
No. schools operated	51
Teachers	53
Pupils	3,121
Amount expended for schools, '94	$9,723.00
Permanent school fund	12,361.40
Average annual precipitation	36 inches
Annual mean temperature	54 degrees

No railroad. Shipments probably go to Pulaski and Phelps counties.

MARION.

Area, taxable	276,612 acres
Land, per cent in cultivation	85
Principal agricultural products	Corn, wheat, oats, grass
Principal live-stock	cattle, hogs
Topography	rolling
Population	26,233
Assessed valuation	$9,438,487
No. horses and mules	9,799
Cattle	11,911
No. sheep	9,725
Hogs	13,566
Schools operated	67
Teachers	134
Pupils	8,091
Amount expended for schools, 1894	$76,278.95
Permanent school fund	59,697.41
Average annual precipitation	32.4 inches
Annual mean temperature	51 degrees

SHIPMENTS.

Cattle, cars	91	Hay and straw	24	Eggs, doz	3,900	Lime & cement	1,061
Hogs	99	Hides, lbs	1,500	Butter, lbs	284	Ice	421
Horses and mules	26	Flour	34,680,000	Beer, gals	30,000	Other	16
Sheep	34	Shipstuff	270,000	Lumber, cars	3,443	Miscel., lbs	10,011,135
Wheat, cars	28	Fish	20,000	Brick	18	Other agricultural products	87,120
Oats	2	Poultry	30,172	Stone	489		

MERCER.

Area, taxable	288,126 acres
Land, per cent in cultivation	95
Principal agricultural products	Corn, wheat, grass
Principal live-stock	cattle, hogs, horses
Mineral developed	stone
Topography	rolling slightly to broken
Population	14,581
Assessed valuation	$3,869,307
No. horses and mules	12,417
No. cattle	30,517
Sheep	6,836
Hogs	14,260
Schools operated	89
Teachers	113
Pupils	4,812
Amount expended for schools, '94	$26,970.80
Permanent school fund	56,438.83
Average annual precipitation	38.5 inches
Annual mean temperature	52.2 degrees

SHIPMENTS.

Cattle, cars	147	Hay	9	Eggs, doz	75,068	Hoops	4
Hogs	138	Furs, lbs	114	Butter, lbs	16,430	Saw-dust	4
Horses and mules	4	Wool	740	Feathers	430	Posts	2
Sheep	19	Pelts	656	Beer, gal	850	Shingles	1
Mixed live-stock	1	Hides	6,730	Apples, brls	970	Iron	1
Bl'd horse, head	1	Flour	1,650	Lumber, cars	19	Ice	40
Cattle	1	Nursery stock	8,890	Ties	16	Sand	16
Corn, cars	28	Game	1,928	Logs	31	Misc., lbs	126,078
Oats	3	Poultry	87,649	Wood	15	Bread	2,960

MILLER.

Area, taxable	326,818 acres
Land, per cent in cultivation	45
Principal agricultural products	Grass, corn, wheat, fruit, flax
Principal live-stock	Horses, cattle, hogs, sheep
Minerals developed	coal, tiff
Topography	undulating to broken
Population	14,162
Assessed valuation	$2,270,897
No. horses and mules	7,742
No. cattle	15,491
Sheep	11,091
Hogs	27,881
Schools operated	77
Teachers	87
Pupils	5,547
Amount expended for schools, '94	$17,691.50
Permanent school fund	38,148.89
Average annual precipitation	40 inches
Annual mean temperature	55 degrees

SHIPMENTS.

Cattle, cars	89	Furs	278	Eggs, doz	78,965	Ties	179
Hogs	143	Hides	8,298	Butter, lbs	4,558	Wood	85
Horses and mules	4	Flour	200,000	Dairy products	500	Hoops	6
Sheep	30	Veal	600	Feathers	4,505	Hoop-poles	1
Mixed live-stock	39	Game	5,483	Molasses, gal	673	Stone	1
Wheat	10	Canned goods	800	Whisky	717	Tiff	9
Tobacco, lbs	3,000	Tallow	360	Lumber, cars	6	Miscel, lbs	13,519
Wool	210	Poultry	244,003				

MISSISSIPPI.

Area, taxable	247,852 acres
Land, per cent in cultivation	46
Principal agricultural products	Wheat, corn, potatoes, melons
Principal live-stock	hogs, cattle, horses
Topography	level
Population	10,134
Assessed valuation	$2,533,842
No. horses and mules	4,811
Cattle	6,426
No. sheep	296
Hogs	12,352
Schools operated	28
Teachers	40
Pupils	3,157
Amount expended for schools, '94	$16,319.35
Permanent school fund	21,866.13
Average annual precipitation	44 inches
Annual mean temperature	58 degrees

SHIPMENTS.

Cattle, cars	63	Melons	192	Eggs, doz	10,350	Potatoes, brls	1,650
Hogs	64	Furs, lbs	5,980	Feathers, lbs	300	Lumber, cars	1,507
Mixed live-stock	26	Hides	654	Turnips, cars	3	Staves	10
Wheat	115	Flour	8,040,000	Vegetables, lbs.	1,343,985	Ice	3
Corn	294	Corn meal	5,500,000	Beer and liquor, gal.	4,163	Other	9
Hay	2	Game	2,204			Miscel., lbs	85,785
Mixed grain	164	Poultry	2,440				

No report of shipments by boat.

MONITEAU.

Area, taxable ..... 258,150 acres	No. cattle 12,813
Land, per cent in cultivation 90	Sheep 8,471
Principal agricultural products	Hogs 16,974
Corn, wheat, oats, grass	Schools operated 84
Principal live-stock .... cattle, hogs, horses	Teachers employed 101
Minerals developed ..... lead, coal	Pupils 4,957
Topography ..... undulating	Amount expended for schools, 1894 .. $26,957.29
Population 15,360	Permanent school fund 36,910.08
Assessed valuation $4,350,482	Average annual precipitation ..... 40 inches
No. horses and mules 9,145	Annual mean temperature ..... 54 degrees

SHIPMENTS.

Cattle, cars 161	Oats 2	Eggs, doz 496,329	Lumber, cars 4
Hogs 260	Hay 19	Butter, lbs 6,748	Logs 4
Horses and mules .. 35	Wool, lbs 375	Dairy products .. 43,940	Wood 62
Sheep 43	Hides 37,439	Feathers 2,811	Coal 45
Mixed live-stock .. 115	Flour 360,000	Clover seed, bu .. 2,807	Junk 3
Bl'd hogs, head. 8	Veal 338	Oil, lbs 1,520	Other 28
Wheat, cars 131	Game 4,657	Apples, brls 1,055	Miscel. lbs 799,700
Corn 2	Poultry 644,562		

MONROE.

Area, taxable ..... 481,511 acres	No. cattle 21,685
Land, per cent in cultivation 92	Sheep 25,527
Principal agricultural products	Hogs 21,262
Corn, wheat, oats, grass, tobacco	Schools operated 105
Principal live-stock	Teachers employed 123
Hogs, cattle, horses and sheep	Pupils 6,879
Minerals developed ..... coal	Money expended for schools, '94 .... $35,526.85
Topography ..... undulating	Permanent school fund $122,125.08
Population 20,790	Average annual precipitation ..... 37 inches
Assessed valuation $7,079,904	Annual mean temperature ..... 53 degrees
No. horses and mules 17,433	

SHIPMENTS.

Cattle, cars 394	Hay 161	Veal 16,075	Clover seed 84
Hogs 438	Tobacco, lbs ... 21,129	Game 30	Molasses, gal 254
Horses and mules. 116	Wool 165,580	Lard 1,009	Whisky 247
Sheep 153	Pelts 3,213	Tallow 15,065	Lumber, cars 35
Mixed live-stock ... 43	Hides 54,543	Poultry 666,261	Piling 1
Blooded horses, hd. 21	Flour 1,390,918	Eggs, doz 94,734	Ties 155
Cattle 12	Shipstuff 61,980	Butter, lbs 2,108	Hoops 5
Hogs 4	Corn-meal 1,200	Feathers 4,877	Junk 5
Wheat, cars 7	Nursery stock ... 1,300	Nuts, bu 23	Other 66
Corn 42	Beef 3,226	Timothy seed 82	Miscel., lbs .. 1,267,133
Oats 14			

MONTGOMERY.

Area, taxable ..... 331,389 acres	No. horses and mules. 10,453
Land, per cent in cultivation 80	Cattle 15,166
Principal agricultural products.....	Sheep..... 9,087
Oats, corn, wheat, fruit, grass, tobacco	Hogs..... 17,606
Principal live-stock	Schools operated.....87
Hogs, cattle, sheep,horses	Teachers 105
Minerals developed .....coal, fire-clay	Pupils 5,693
Topography ....level bottoms,	Amount expended for schools, '94 .$44,439.71
undulating prairie, some broken bluffs	Permanent school fund.....26,901.41
Population.....16,850	Average annual precipitation .....37 inches
Assessed valuation $4,940,707	Annual mean temperature.....54 degrees

SHIPMENTS.

Cattle, cars..... 130	Oats 63	Tallow..... 5,895	Potatoes 90
Hogs..... 267	Hay. 6	Poultry..... 725,226	Lumber, cars..... 13
Horses and mules.. 17	Tobacco, lbs... 253,495	Eggs, doz 335,605	Piling..... 23
Sheep 23	Wool..... 54,650	Butter, lbs..... 26,063	Ties..... 500
Mixed live-stock... 38	Pelts..... 10,466	Cheese..... 515	Wood 1
Calves, head 3	Hides 68,919	Feathers..... 2,025	Hoops 35
Bl'd cattle 1	Flour 30,000	Onions, bu..... 175	Posts 5
Sheep..... 2	Corn-meal..... 12,000	Timothy seed..... 343	Coal 2
Hogs..... 13	Dried fruit..... 740	Clover seed 1,595	Junk 3
Wheat, cars..... 64	Pork 595	Beans, lbs 705	Clay 25
Corn..... 13	Game.... 21,215	Apples, brls..... 258	Miscel., lbs..... 115,690

No report of shipments from Montgomery City over the Wabash railroad.

MORGAN.

Area, taxable.....355,540 acres	No. cattle..... 14,656
Land, per cent in cultivation.....60	Sheep..... 10,494
Principal agricultural products.....	Hogs. 14,548
Corn, wheat, grass, oats	Schools operated..... 73
Principal live-stock .....cattle, hogs, sheep	Teachers 78
Minerals developed .....coal, clay	Pupils 4,304
Topography .....undulating to broken	Money expended for schools, 1894...$20,893.31
Population..... .12,311	Permanent school fund 28,678.68
Assessed valuation $2,848,678	Average annual precipitation .....42 inches
No. horses and mules.....6,930	Annual mean temperature .....54 degrees

SHIPMENTS.

Cattle, cars..... 58	Wheat..... 30	Eggs, doz 65,960	Logs..... 1
Hogs..... 177	Oats 4	Butter, lbs..... 905	Wood 4
Horses and mules... 2	Hay..... 5	Dairy products. 20,000	Hoops 9
Sheep..... 32	Game, lbs 3,495	Lumber, cars..... 11	Other 8
Mixed live-stock... 10	Poultry..... 110,277	Ties..... 2,120	Miscel., lbs..... 47,361

No report of express shipments from Versailles.

NEW MADRID.

Area, taxable	350,490 acres
Land, per cent in cultivation	25
Principal agricultural products	Corn, wheat, hay, cotton, potatoes
Principal live-stock	horses, mules, cattle
Topography	level bottom
Population	9,817
Assessed valuation	$2,047,585
No. horses and mules	3,784
Cattle	7,019
No. sheep	597
Hogs	15,059
Schools operated	31
Teachers	38
Pupils	3,052
Amount expended for schools, '94	$13,664.41
Permanent school fund	35,343.59
Average annual precipitation	45 inches
Annual mean temperature	58 degrees

SHIPMENTS.

Cattle, cars 1	Flour, lbs 2,680	Vegetables, lbs. 103,500	Lumber, cars 3,922
Mixed live-stock 91	Shipstuff 27,560	Oil 1,600	Other 89
Hay, lbs 8,000	Cotton seed, bu. 633	Cotton, bales 571	Miscel., lbs 819,007
Mixed grain, cars. 230			

No report of river shipments.

NEWTON.

Area, taxable	394,057 acres
Land, per cent in cultivation	60
Principal agricultural products	Corn, wheat, oats, grass, tobacco, fruit
Principal live-stock	cattle, hogs, horses
Mineral developed	lead, zinc, tripoli
Topography	broken
Population	22,108
Assessed valuation	$4,599,739
No. horses and mules	11,558
No. cattle	14,910
Sheep	1,987
Hogs	11,344
Schools operated	99
Teachers employed	150
Pupils	8,558
Amount expended for schools, 1894	$41,055.57
Permanent school fund	31,311.37
Average annual precipitation	43.9 inches
Annual mean temperature	56.7 degrees

SHIPMENTS.

Cattle, cars 47	Beeswax 100	Clover seed 250	Pig-lead 61
Hogs 58	Dried fruit 8,000	Millet seed 502	Lead ore 12
Horses and mules 2	Pork 1,563	Beans, crates 24	Zinc 13
Sheep 7	Veal 1,403	Vegetables, lbs. 3,380	Zinc ore 361
Mixed live-stock 31	Game 5,200	Tomatoes, crates 4,000	Slag 12
Wheat, cars 470	Fish 1,167	Canned tomatoes, cases 1,650	Coal 2
Corn 38	Fish spawn 3,078	Molasses, gals 1,650	Ice 2
Oats 4	Tallow 5,490	Wine 50	Junk 2
Flax seed 2	Poultry 68,628	Potatoes, brls 1,118	Tripoli 15
Hay 38	Eggs, doz 184,735	Lumber, cars 101	Sand 8
Tobacco, lbs 605	Butter, lbs 3,974	Ties 2	Charcoal 1
Wool 7,090	Feathers 1,007	Wood 10	Gravel 3
Pelts 2,310	Onions, bu 335	Brick 2	Other 127
Hides 180,317	Timothy seed 450		Miscel., lbs 1,564,387
Flour 4,211,268			

NODAWAY.

Area, taxable	553,186 acres	No. cattle	44,849
Land, per cent in cultivation	91	Sheep	4,543
Principal agricultural products	Corn, wheat, oats, grass, fruit	Hogs	40,637
		Schools operated	180
Princ'l live-stock	cattle, hogs, mules, horses	Teachers	243
Minerals developed	coal, lime	Pupils	10,646
Topography	mostly rolling	Money expended for schools, 1894	$83,541.02
Population	30,910	Permanent school fund	127,514.67
Assessed valuation	$11,140,572	Average annual precipitation	33 inches
No. horses and mules	25,176	Annual mean temperature	48 degrees

SHIPMENTS.

Cattle, cars	1,138	Hides	294,781	Eggs, doz	153,665	Potatoes	679
Hogs	989	Flour	280,760	Butter, lbs	87,918	Lumber, cars	6
Horses and mules	102	Corn meal	888	Cheese	12,229	Ties and wood	2
Sheep	13	Nursery stock	93,147	Feathers	1,280	Brick	2
Mixed live-stock	255	Honey	430	Dairy products and eggs	86,000	Tiling	2
Bl'd hogs, head	147	Dried fruit	365			Stone	1
Wheat, cars	81	Beef	1,590	Millet seed, bu	1,100	Iron	3
Corn	1,374	Pork	270	Vegetables, lbs	102,000	Other forest products, lbs	1,652,000
Oats	45	Veal	4,271	Cherries	2,150		
Rye	3	Game	160	Molasses, gal	53	Ice	48
Flax-seed	1	Fish	550	Wine	150	Junk	4
Hay	75	Lard	270	Beer	4,906	Sand	2
Mixed grain	24	Tallow	5,475	Whisky	260	Other	14
Wool, lbs	19,343	Grease	45,330	Apples, brls	18,674	Miscel., lbs	4,609,768
Pelts	200	Poultry	915,388				

OREGON.

Area, taxable	437,542	No. cattle	1,292
Land, per cent in cultivation	40	Sheep	3,935
Principal agricultural products	Corn, wheat, clover, cotton, fruit	Hogs	23,869
		Schools operated	57
Principal live-stock	Hogs, cattle, sheep, horses	Teachers	65
		Pupils	4,133
Topography	broken	Money expended for schools, 1894	$15,615.32
Population	10,257	Permanent school fund	10,301.59
Assessed valuation	$2,145,708	Average annual precipitation	47 inches
No. horses and mules	4,106	Annual mean temperature	58 degrees

SHIPMENTS.

Cattle, cars	23	Flour, lbs	80,000	Lumber, cars	8	Other	26
Hogs	22	Cotton, bales	40	Ties	78	Miscel., lbs	282,000
Horses and mules	3						

OSAGE.

Area, taxable	367,397 acres
Land, per cent in cultivation	25
Principal agricultural products	Corn, wheat, grass, fruit
Principal live-stock	cattle, hogs, horses, sheep
Topography	broken
Population	13,080
Assessed valuation	$3,553,151
No. horses and mules	6,265
No. cattle	12,942
Sheep	9,399
Hogs	19,331
Schools operated	71
Teachers	74
Pupils	4,606
Money expended, schools, 1894	$19,134.79
Permanent school fund	34,274.61
Average annual precipitation	36 inches
Annual mean temperature	55 degrees

SHIPMENTS.

Cattle, cars	35	Wheat, cars	148	Flour	2,360,000	Lumber, cars	3
Hogs	86	Corn	23	Shipstuff	70,000	Ties	62
Horses and mules	7	Corn-cobs	21	Game	2,274	Hoops	23
Sheep	17	Melons	1	Poultry	99,403	Fire-brick	1
Mixed live-stock	8	Wool, lbs	362	Eggs, doz	4,020	Junk	1
Bl'd cattle, head	1	Pelts	419	Butter, lbs	757	Miscel., lbs	925,621
Sheep	5	Hides	3,351	Clover seed, bu	483		

OZARK.

Area, taxable	204,271 acres
Population	9,795
Assessed valuation	$901,806
No. horses and mules	4,130
Cattle	12,230
Sheep	3,523
Hogs	17,237
No. schools	66
Teachers	69
Pupils	4,343
Amount expended for schools, '94	$8,637.11
Permanent school fund	10,672.63
Average annual precipitation	49 inches
Annual mean temperature	57 degrees

No railroad; products shipped from and credited to adjacent counties.

PEMISCOT.

Area, taxable	294,222 acres
Population	5,975
Assessed valuation	$1,090,981
No. horses and mules	2,370
Cattle	6,860
Sheep	328
Hogs	11,499
No. schools operated	27
Teachers	28
Pupils	1,963
Money expended for schools, 1894	$6,498.93
Permanent school fund	14,577.41
Average annual precipitation	46.5 inches
Annual mean temperature	58 degrees

No railroad; have not been able to obtain shipments made by river.

PERRY.

Area, taxable	294,580 acres
Land, per cent in cultivation	66
Principal agricultural products	Wheat, corn, clover, fruit
Principal live-stock	horses, cattle
Minerals developed	lead, in a limited way
Topography	Undulating to broken, level bottoms
Population	13,237
Assessed valuation	$2,846,150
No. horses and mules	6,993
No. cattle	9,304
Sheep	9,909
Hogs	24,348
Schools operated	57
Teachers	62
Pupils	4,710
Amount expended for schools, '94	$17,444.78
Permanent school fund	37,565.27
Average annual precipitation	40 inches
Annual mean temperature	56 degrees

Railroad from Chester, Ill., to Perryville was operated only a short time in 1894, and makes no report. Are unable to obtain statistics from river shipments.

PETTIS.

Area, taxable	427,203 acres
Land, per cent in cultivation	92
Principal agricultural products	Grass, corn, wheat, fruit
Principal live-stock	cattle, hogs
Mineral developed	coal
Topography	undulating and broken
Population	31,151
Assessed valuation	$11,047,246
No. horses and mules	26,723
No. cattle	25,927
Sheep	10,406
Hogs	17,235
Schools	105
Teachers	182
Pupils	9,520
Amount expended for schools, 1894	$88,775.40
Permanent school fund	61,054.76
Average annual precipitation	38 inches
Annual mean temperature	54.2 degrees

SHIPMENTS.

Cattle, cars	605	Wool	60,322	Eggs, doz	287,871	Apples, brls	1,527
Hogs	398	Hides	1,605,235	Butter, lbs	11,235	Potatoes	62
Horses and mules	74	Flour	3,314,727	Feathers	9,100	Lumber, cars	9
Sheep	26	Shipstuff	44,512	Onions, bu	625	Ties	7
Mixed live-stock	13	Corn-meal	12,210	Timothy seed	5,000	Logs	22
Bl'd horses, head	6	Nursery stock	3,316	Vegetables, lbs	20,000	Wood	1
Sheep	5	Dried fruit	50,790	Cabbage, crates	150	Tiling	132
Hogs	121	Pork	3,000	Tomatoes	220	Stone	2
Wheat, cars	227	Veal	280	String beans	210	Stoneware, lbs	2,815
Corn	160	Game	230	Grapes	1,000	Lime, cars	1
Oats	80	Meat	215	Molasses, gals	5,698	Tar	4
Flax seed	14	Provisions	8,593	Wine	950	Ice	47
Broom-corn	16	Lard	15,820	Beer	4,560	Junk	9
Hay	262	Tallow	180,000	Whisky	7,200	Other	76
Mixed grain	1	Poultry	443,541	Oil, lbs	444,000	Miscel., lbs	3,715,611
Tobacco, lbs	66,178						

PHELPS.

Area, taxable	367,163 acres
Land, per cent in cultivation	80
Principal agricultural products	Corn, wheat, grass, fruit
Principal live-stock	Cattle, hogs, horses, sheep
Minerals developed	iron, fire-clay
Topography	undulating to broken
Population	12,636
Assessed valuation	$2,450,450
No. horses and mules	5,591
No. cattle	12,794
Sheep	8,245
Hogs	18,074
Schools operated	76
Teachers	85
Pupils	4,756
Amount expended for schools, '94	$19,012.16
Permanent school fund	19,077.70
Average annual precipitation	41.4 inches
Annual mean temperature	53.1 degrees

SHIPMENTS.

Cattle, cars	102	Hides	66,101	Eggs, doz	178,743	Hoops	2
Hogs	84	Flour	1,079,460	Butter, lbs	5,980	Posts	6
Horses and mules	3	Shipstuff	150,420	Feathers	15,034	Stone	12
Sheep	71	Corn-meal	2,020	Clover seed, bu	2,750	Iron ore	4
Mixed live-stock	232	Nursery stock	1,760	Molasses, gal	190	Coal	1
Wheat, cars	67	Dried fruit	1,570	Beer	57,970	Junk	1
Corn	1	Pork	250	Whisky	220	Clay	9
Hay	7	Veal	2,787	Lumber, cars	2	Sand	327
Tobacco, lbs	5,445	Game	33,174	Ties	132	Onyx	1
Wool	43,520	Tallow	5,215	Wood	69	Miscel., lbs	1,095,260
Pelts	2,375	Poultry	419,200				

PIKE.

Area, taxable	423,173 acres
Land, per cent in cultivation	85
Principal agricultural products	Wheat, corn, oats, tobacco, grass
Principal live-stock	cattle, hogs, horses
Minerals developed	stone
Topography	eastern part broken, central and west, undulating
Population	26,321
Assessed valuation	$8,974,970
No. horses and mules	14,169
No. cattle	20,423
Sheep	16,343
Hogs	19,558
Schools operated	118
Teachers	162
Pupils	8,155
Amount expended for schools, '94	$34,485.47
Permanent school fund	40,306.21
Average annual precipitation	34 inches
Annual mean temperature	51.7 degrees

SHIPMENTS.

Cattle, cars	319	Hay	82	Eggs, doz	31,923	Wood	120
Hogs	352	Mixed grain	13	Butter, lbs	4,554	Hoops	4
Horses and mules	46	Wool, lbs	34,695	Feathers	1,710	Brick	75
Sheep	93	Pelts	530	Timothy seed, bu	500	Stone	291
Mixed live-stock	99	Hides	42,549	Grass seed	865	Lime and cement	401
Bl'd horses, head	3	Flour	3,021,485	Plums, crates	300	Ice	17
Jacks	37	Shipstuff	74,015	Molasses, gal	230	Junk	4
Sheep	1	Corn-meal	1,960	Beer	3,455	Sand	2
Cattle	1	Nursery stock	28,317	Apples, brls	192	Other	108
Wheat, cars	630	Game	1,025	Lumber, cars	578	Miscel., lbs	10,653,936
Corn	118	Fish	112,383	Ties	14	Other agricultural products, lbs.	243,700
Oats	55	Tallow	16,000	Logs	20		
Flax seed	2	Poultry	398,573				

PLATTE.

Area, taxable	257,275 acres
Land, per cent in cultivation	90
Principal agricultural products	Grass, corn, wheat
Principal live-stock	cattle, hogs
Topography	Undulating, river bluffs broken
Population	16,248
Assessed valuation	$5,769,470
No. horses and mules	11,561
No. cattle	16,130
Sheep	5,153
Hogs	19,570
Schools operated	78
Teachers	85
Pupils	4,996
Amount expended for schools, '94	$33,373.94
Permanent school fund	32,987.47
Average annual precipitation	38 inches
Average mean temperature	53 degrees

SHIPMENTS.

Cattle, cars	202	Wool, lbs	205	Lard	953	Blackberries	107
Hogs	388	Pelts	405	Tallow	2,852	Strawberries	14
Horses and mules	10	Hides	17,477	Poultry	49,314	Grapes	366
Sheep	5	Flour	1,088,860	Eggs, doz	47,221	Apples, bris	16,799
Mixed live-stock	152	Shipstuff	85,050	Butter, lbs	1,446	Potatoes	30
Bl'd cattle, head	30	Corn-meal	200	Timothy seed, bu	120	Lumber, cars	4
Hogs	6	Dried fruit	835	Clover seed	5,901	Logs	28
Wheat, cars	387	Beef	518	Tomatoes, crates	10	Wood	20
Corn	49	Pork	312	Vegetables, lbs.	706,000	Forest products	104
Oats	2	Veal	125	Peaches, crates	300	Miscel., lbs	377,254
Hay	4	Fish	10,120				

POLK.

Area, taxable	396,613 acres
Land, per cent in cultivation	.73
Principal agricultural products	Wheat, corn, oats, grass
Principal live-stock	Cattle, hogs, horses, sheep
Topography	Undulating; broken near streams
Population	20,839
Assessed valuation	$4,065,633
No. horses and mules	15,124
No. cattle	21,356
Sheep	12,578
Hogs	27,600
Schools operated	96
Teachers	137
Pupils	7,728
Amount expended for schools, 1894	$31,094.26
Permanent school fund	56,750.25
Average annual precipitation	36 inches
Annual mean temperature	55 degrees

SHIPMENTS

Cattle, cars	121	Hay	10	Tallow	790	Wood	661
Hogs	470	Mixed grain	12	Poultry	330,335	Stone	64
Horses and mules	25	Tobacco, lbs.	200	Eggs, doz	351,550	Lime and cement	3
Sheep	15	Wool	26,615	Butter, lbs	7,778	Junk	1
Mixed live-stock	159	Pelts	1,395	Feathers	2,719	Sand and brick	10
Bl'd horses, head	2	Hides	26,160	Molasses, gals	185	Charcoal	155
Wheat, cars	130	Flour	2,265,409	Lumber, cars	21	Other	69
Corn	20	Dried fruit	2,600	Ties	22	Miscel., lbs	1,510,340
Oats	2	Game	36,057	Logs	1		

PULASKI.

Area, taxable	211,385 acres
Land, per cent in cultivation	40
Principal agricultural products	Corn, wheat, grass, fruit
Principal live-stock	Horses, cattle, sheep, hogs
Topography	broken
Population	9,387
Assessed valuation	$1,591,606
No. horses and mules	4,654
No. cattle	11,956
Sheep	7,722
Hogs	20,579
Schools operated	60
Teachers	67
Pupils	3,770
Amount expended for schools, '94	$14,042.99
Permanent school fund	21,324.03
Average annual precipitation	40 inches
Annual mean temperature	54 degrees

SHIPMENTS.

Cattle, cars	84	Wool, lbs	28,606	Grease	21,821	Ties	41
Hogs	112	Pelts	2,515	Poultry	496,871	Logs	2
Horses and mules	1	Hides	28,238	Eggs, doz	178,175	Wood	4
Sheep	13	Flour	201,715	Butter, lbs	1,798	Junk	1
Mixed live-stock	218	Shipstuff	40,750	Feathers	2,833	Other	6
Wheat, cars	47	Corn meal	20,915	Lumber, cars	20	Misc, lbs	212,602
Hay	4	Tallow	1,340				

PUTNAM.

Area, taxable	326,818 acres
Land, per cent in cultivation	90
Principal agricultural products	Corn, wheat, grass
Principal live-stock	Cattle, hogs, sheep, horses
Mineral	coal
Topography	undulating to broken
Population	15,365
Assessed valuation	$3,980,774
No. horses and mules	13,737
No. cattle	31,625
Sheep	12,730
Hogs	11,049
Schools operated	85
Teachers	98
Pupils	5,637
Amount expended for schools, '94	$26,288.87
Permanent school fund	48,130.09
Average annual precipitation	34 inches
Annual mean temperature	50 degrees

SHIPMENTS.

Cattle, cars	229	Wool, lbs	3,660	Seed, cars	5	Hoops, cars	17
Hogs	83	Hides	9,340	Fruit and vegetables, lbs	11,140	Brick	1
Horses and mules	39	Flour	17,280	Apples, brls	450	Coal	4,251
Sheep	25	Shipstuff	30,000	Lumber, cars	1	Lime	1
Wheat, cars	1	Poultry	181,154	Other fruit prod., lbs	442,600	Junk	1
Corn	25	Eggs, doz	85,802			Other	9
Oats	13	Butter, lbs	820			Miscel, lbs	495,212
Hay	1	Dairy products	9,385				

RALLS.

Area, taxable	302,041 acres
Land, per cent in cultivation	77
Principal agricultural products	Wheat, corn, oats, grass
Principal live-stock	hogs, cattle, horses
Mineral developed	coal
Topography	undulating to broken
Population	12,294
Assessed valuation	$4,527,050
No. horses and mules	8,290
No. cattle	15,182
Sheep	9,349
Hogs	14,206
Schools operated	74
Teachers	92
Pupils	3,796
Amount expended for schools, '94	$20,815.27
Permanent school fund	38,964.11
Average annual precipitation	32 inches
Annual mean temperature	52 degrees

SHIPMENTS.

Cattle, cars	169	Hay	55	Eggs, doz	27,920	Potatoes	156
Hogs	219	Straw	1	Butter, lbs	3,545	Lumber, cars	7
Horses and mules	10	Mixed grain	11	Feathers	862	Ties	91
Sheep	37	Wool, lbs	10,000	Timothy seed, bu	5,900	Posts	1
Mixed live-stock	21	Pelts	9,000	Clover seed	1,000	Coal	163
Bl'd horses, head	16	Fish	2,080	Plums, crates	14	Junk	4
Wheat	149	Tallow	900	Molasses, gal	250	Other	4
Oats	35	Poultry	205,922	Apples, brls	1,050	Miscel., lbs	2,044,202
Broom-corn	4						

No report of shipments from Huntington and Rensselaer.

RANDOLPH.

Area, taxable	297,548 acres
Land, per cent cultivated	85
Principal agricultural products	Corn, grass, wheat
Principal live-stock	Cattle, hogs, horses
Mineral	coal
Topography	undulating to broken
Population	24,893
Assessed valuation	$6,825,815
No. horses and mules	11,604
No. cattle	9,079
Sheep	12,301
Hogs	10,000
Schools operated	90
Teachers	125
Pupils	9,539
Amount expended for schools, '94	$49,048.92
Permanent school fund	50,028.39
Average annual precipitation	37 inches
Annual mean temperature	54 degrees

SHIPMENTS.

Cattle, cars	398	Fancy dogs	21	Poultry	396,040	Staves	60
Hogs	308	Flax seed, cars	6	Eggs, doz	86,307	Hoops	27
Horses and mules	55	Hay	30	Butter, lbs	6,377	Posts	3
Sheep	112	Wool, lbs	87,274	Feathers	497	Brick	207
Mixed live-stock	20	Pelts	5,123	Strawberries, crts	1040	Coal	6,860
Bl'd horses, head	17	Hides	227,754	Beer, gals	13,102	Tar	4
Cattle	20	Flour	863,070	Apples, brls	177	Ice	19
Sheep	16	Shipstuff	502,600	Lumber, cars	9	Junk	25
Hogs	90	Corn-meal	9,330	Piling	43	Clay	2
Wheat, cars	53	Nursery stock	18,500	Ties	182	Sand	1
Corn	2	Game	7,005	Logs	1	Other	224
Oats	2	Tallow	240,090	Wood	1	Miscel., lbs	3,789,778
Fancy chickens	98						

RAY.

Area, taxable	354,653 acres
Land, per cent in cultivation	90
Principal agricultural products	Wheat, corn, oats, hemp, grass
Principal live-stock	horses, mules, cattle
Minerals developed	coal
Topography	one-half undulating prairie, remainder rolling
Population	24,215
Assessed valuation	$8,501,466
No. horses and mules	17,682
No. cattle	25,792
Sheep	8,623
Hogs	45,482
Schools operated	99
Teachers	124
pupils	7,993
Amount expended for schools, 1894	$58,109.56
Permanent school fund	91,961.56
Average annual precipitation	38 inches
Annual mean temperature	53 degrees

SHIPMENTS.

Cattle, cars	174	Hay	94	Butter, lbs	9,957	Logs	22
Hogs	203	Wool, lbs	4,650	Clover seed, bu	160	Wood	21
Horses and mules	11	Pelts	1,920	Fruits and vegetables, lbs	9,460	Other forest products, cars	16
Sheep	23	Hides	263,370	Wine, liquor and beer, gal	8,087	Saw-dust	5
Mixed live-stock	694	Flour	1,179,210	Apples, brls	2,051	Brick	2
Bl'd horses, head	27	Shipstuff	134,300	Potatoes	963	Stone	141
Sheep	3	Corn meal	580	Lumber, cars	440	Coal	5,661
Hogs	10	Game	8,525	Piling	7	Sand and gravel	27
Wheat, cars	353	Tallow	300	Ties	6	Other	38
Corn	119	Poultry	414,769			Miscel., lbs	288,517
Oats	6	Eggs, doz	132,273				
Rye	1						

RIPLEY.

Area, taxable	340,976 acres
Land, per cent in cultivation	20
Principal agricultural products	Corn, wheat, hay, oats, fruit
Principal live-stock	hogs, horses, cattle
Topography	Level in south to broken in north
Population	8,332
Assessed valuation	$1,620,098
No. horses and mules	3,241
No. cattle	8,718
Sheep	3,640
Hogs	19,280
Schools operated	56
Teachers	60
Pupils	3,534
Amount expended for schools, '94	$16,603.46
Permanent school fund	30,866.52
Average annual precipitation	46 inches
Annual mean temperature	58 degrees

SHIPMENTS.

Cattle, cars	44	Pelts, lbs	394	Feathers	134	Hoops	7
Hogs	51	Game	107	Lumber, cars	727	Brick	2
Sheep	5	Poultry	20,684	Ties	175	Junk	1
Mixed live-stock	8	Eggs, doz	420	Staves	6	Other	51

REYNOLDS.

Area, taxable	499,653 acres
Population	6,633
Assessed valuation	$1,753,595
No. horses and mules	3,257
Cattle	9,379
Sheep	6,270
Hogs	16,247
No. schools in operation	52
Teachers	54
Pupils	2,627
Amount expended for schools, '94	$9,285.48
Permanent school fund	12,761.76
Average annual precipitation	42.8 inches
Annual mean temperature	55 degrees

ST. CHARLES.

Area, taxable	333,288 acres
Principal agricultural products	Wheat, corn, oats, hay
Principal live-stock	cattle, hogs, horses
Mineral developed	stone
Topography	level to broken
Population	23,065
Assessed valuation	$9,192,073
No. horses and mules	11,310
Cattle	12,996
No. sheep	6,614
Hogs	23,977
Schools operated	86
Teachers	97
Pupils	7,429
Amount expended for schools, '94	$43,469.25
Permanent school fund	105,942.75
Average annual precipitation	35.2 inches
Annual mean temperature	54 degrees

SHIPMENTS.

Cattle, cars	103	Flour	6,685,391	Feathers	4,120	Beer	13,510
Hogs	229	Shipstuff	1,055,274	Nuts, bu	64	Apples, brls	235
Horses and mules	5	Corn-meal	38,450	Onions	3,919	Potatoes	165
Sheep	25	Nursery stock	21,946	Clover seed	62,982	Lumber, cars	47
Mixed live-stock	85	Honey	5,032	Millet seed	10,502	Ties	78
Bl'd horses, head	1	Beeswax	100	Peas, crates	26	Logs	17
Calves	31	Dried fruit	2,330	Cucumbers	5	Wood	353
Sheep	34	Beef	400	Peaches	37	Hoops	1
Wheat, cars	1,158	Pork	31,001	Plums	29	Posts	9
Corn	117	Veal	78,536	Raspberries	86	Brick	206
Oats	9	Game	702	Blackberries	105	Stone	239
Hay	5	Fish	30,968	Strawberries	37	Coal	7
Mixed grain	13	Lard	12,756	Gooseberries	22	Tar	2
Tobacco, lbs	428,158	Tallow	26,668	Grapes	708	Ice	84
Wool	46,337	Poultry	982,151	Molasses, gal	25,000	Other	27
Pelts	12,261	Eggs, doz	1,521,320	Wine	21,663	Miscel., lbs	3,253,873
Hides	49,015	Butter, lbs	130,165				

No report of shipments from St. Charles over the Wabash.

St. Clair.

Area, taxable	429,007 acres	No. cattle	19,941
Land, per cent in cultivation	86	Sheep	6,092
Principal agricultural products	Corn, wheat, oats, hay, flax	Hogs	20,060
		Schools operated	114
Principal live-stock	Cattle, horses, hogs, mules	Teachers	104
		Pupils	6,050
Minerals developed	coal	Amount expended for schools, '94	$19,958.52
Topography	undulating to broken	Permanent school fund	56,345.45
Population	16,747	Average annual precipitation	40 inches
Assessed valuation	$4,076,257	Annual mean temperature	55.2 degrees
No. horses and mules	12,187		

SHIPMENTS.

Cattle, cars	173	Oats	56	Eggs, doz	49,200	Ties	4
Hogs	270	Flax seed	37	Butter, lbs	1,848	Wood	17
Horses and mules	4	Hay	347	Cheese	178,200	Brick and sand	42
Sheep	4	Wool, lbs	3,100	Timothy seed, bu	4,400	Stone	2
Bl'd horses, head	1	Hides	15,140	Apples, brls	200	Coal	64
Hogs	1	Flour	270,000	Potatoes	300	Other	103
Wheat, cars	29	Castor beans	30,000	Lumber, cars	94	Misc., lbs	1,082,764
Corn	240	Poultry	164,872				

No report of shipments from Lowry City over Kansas City, Omaha & Southern railroad.

St. Francois.

Area, taxable	278,620 acres	No cattle	10,067
Land, per cent in cultivation	50	Sheep	8,484
Principal agricultural products	Corn, wheat, timothy, clover, fruit	Hogs	6,725
		Schools operated	59
Principal live-stock	Hogs, cattle, horses, mules	Teachers	87
		Pupils	6,140
Minerals developed	iron, lead, zinc, granite	Amount expended for schools, 1894	$27,818.30
Topography	undulating to broken	Permanent school fund	35,454.76
Population	17,347	Average annual precipitation	43 inches
Assessed valuation	$3,653,843	Annual mean temperature	55 degrees
No. horses and mules	4,537		

SHIPMENTS.

Cattle, cars	117	Wool, lbs	8,521	Butter, lbs	10,558	Granite	1,650
Hogs	77	Pelts	23,107	Milk, gal	800	Iron ore	65
Horses and mules	8	Hides	45,990	Ties, cars	1	Pig-lead	196
Sheep	25	Flour	8,625,515	Wood	1,040	Lead ore	272
Mixed live-stock	26	Shipstuff	224,460	Hoops	4	Zinc	12
Bl'd cattle, head	8	Veal	1,105	Wagon-hubs	4	Slag	93
Hogs	1	Game	2,079	Brick	16	Junk	1
Wheat, cars	3	Poultry	101,804	Tiff	10	Sand	170
Corn	1	Eggs, doz	137,691	Stone	48	Miscel., lbs	75,046
Hay	15						

STE. GENEVIEVE.

Area, taxable .....304,335 acres	No. schools operated 56
Population.....10,390	Teachers 59
Assessed valuation $2,072,151	Pupils 3,561
No. horses and mules 3,843	Money expended for schools, 1894...$14,268.44
Cattle.....6,573	Permanent school fund 17,870.15
Sheep 3,298	Average annual precipitation .....40 inches
Hogs.....9,765	Annual mean temperature.....55 degrees

SHIPMENTS FROM ST. MARY'S.

Cattle, head 1,800	Pelts.... 1,000	Poultry, coops .. 1,200	Clover seed 1,595
Hogs..... 5,000	Hides..... . 890	Eggs, doz..... 80,000	Molasses, gal..... 900
Horses and mules.. 50	Flour..... 1,580	Butter, lbs..... 11,500	Apples, brls 600
Wheat, bu 80,000	Shipstuff, sks.... 1,200	Nuts, bu..... 180	Potatoes 1,000
Corn 7,500	Dried fruit, lbs.. 1,680	Onions 600	Lumber, ft..... 6,000
Broom-corn, bdls. 500	Veal 200	Pop-corn..... 80	Lead ore, lbs ... 19,000
Wool, lbs 20,000	Tallow 180		

St. Mary is the only station reporting.

ST. LOUIS COUNTY.

Area, taxable .....296,547 acres	No. cattle.....10,418
Land, per cent in cultivation 75	Sheep.....3,226
Principal agricultural products.....	Hogs.....16,345
Corn, wheat, vegetables, fruit	Schools operated..... 110
Principal live-stock .hogs, dairy cows, horses	Teachers 145
Minerals developed ....coal, clay, limestone	Pupils 12,253
Topography.....undulating to broken	Amount expended for schools, '94..$87,543.29
Population... 36,307	Permanent school fund..... .....93,365.16
Assessed valuation.....$27,415,590	Average annual precipitation .....40 inches
No. horses and mules 13,557	Annual mean temperature .....54.4 degrees

This does not include the city of St. Louis.

SHIPMENTS.

Cattle, cars.... 6	Flour..... 630,550	Blackberries, crates 81	Fire-brick..... 1,307
Hogs..... 25	Shipstuff..... ..6,920	Beef, gals..... 535,985	Bld'g terra cotta... 76
Horses and mules... 4	Corn meal 480	Milk 5,150	Lime..... 634
Sheep 5	Nursery stock ... 1,870	Apples, brls 107	Pottery. 1,512
Mixed live-stock... 15	Dried fruit... 220	Potatoes 728	Gravel..... 234
Calves, head..... 21	Pork 8,993	Lumber, cars..... 633	Ice..... 375
Bl'd cattle 16	Veal 3,074	Logs 12	Clay. 1,478
Sheep.. 28	Fish 2,465	Wood..... 431	Paving blocks 9
Wheat, cars 312	Poultry..... ... 14,542	Staves..... 40	Sand... 708
Corn..... 37	Eggs, doz..... 7,380	Hoops 10	White-lead, lbs ... 430
Corn-cobs..... 1	Butter, lbs..... 7,359	Posts 1	Cement..... 6,650
Straw..... 1	Clover seed 581	Shingles..... 1,850	Other..... 71
Furs, lbs 130	Hungarian seed. 4,800	Brick 1,395	Miscel., lbs 131,523
Wool..... 3,225	Beans, crates.... 2,500	Tiling..... 325	Willow baskets.. 6,358
Hides..... 1,577	Rhubarb, lbs 1,957	Stone 933	Cuttings..... 595

No report from Bonhomme and Centaur.

SALINE.

Area, taxable	459,873 acres
Land, per cent in cultivation	85
Principal agricultural products	Corn, wheat, oats, grass, hemp
Principal live-stock	Cattle, hogs, horses, sheep
Minerals developed	some coal
Topography	undulating, breaks on streams
Population	33,762
Assessed valuation	$13,490,513
No. horses and mules	11,203
No. cattle	32,729
Sheep	9,129
Hogs	27,818
Schools operated	142
Teachers	205
Pupils	11,400
Amount expended for schools, '94	$72,944.43
Permanent school fund	164,103.59
Average annual precipitation	38.5 inches
Annual mean temperature	53 degrees

SHIPMENTS.

Cattle, cars	1,552	Furs, lbs	510	Poultry	372,749	Lumber, cars	6
Hogs	817	Wool	187,825	Eggs, doz	20,756	Logs	8
Horses and mules	156	Pelts	984	Butter, lbs	2,885	Wood	21
Sheep	73	Hides	162,178	Dairy products	32,800	Elm forks	11
Mixed live-stock	8	Flour	26,013,451	Feathers	240	Brick	2
Bl'd cattle, head	1	Shipstuff	882,799	Clover seed, bu	2,120	Coal	1
Sheep	1	Nursery stock	6,220	Plums, crates	6,461	Tar	1
Hogs	156	Dried fruit	4,260	Blackberries	45	Ice	1
Wheat, cars	1,143	Game	8,055	Strawberries	10	Junk	1
Corn	797	Provisions	110,420	Min'al water, lbs	86,400	Other	202
Oats	7	Frogs	724	Apples	6,913	Miscel., lbs	2,894,682
Hay	42						

SCHUYLER.

Area, taxable	195,140 acres
Land, per cent in cultivation	90
Principal agricultural products	Wheat, corn, oats, grass, tobacco
Principal live-stock	Cattle, hogs, horses, sheep
Mineral developed	coal
Topography	level prairie and undulating
Population	11,249
Assessed valuation	$2,716,810
No. horses and mules	9,615
No. cattle	15,720
Sheep	31,274
Hogs	10,676
Schools operated	63
Teachers	75
Pupils	3,891
Amount expended for schools, '94	$20,476.66
Permanent school fund	48,229.27
Average annual precipitation	35 inches
Annual mean temperature	50 degrees

SHIPMENTS.

Cattle, cars	227	Tobacco, lbs	259,535	Feathers	1,880	Ties	112
Hogs	304	Wool	137,925	Nuts, bu	840	Wood	52
Horses and mules	63	Hides	26,404	Timothy seed	2,414	Hoops	28
Sheep	135	Flour	8,390	Clover seed	264	Posts	7
Mixed live-stock	8	Shipstuff	17,300	Hungarian seed	1,021	Brick	2
Bl'd sheep, head	1	Beeswax	520	Millet seed	729	Stone	1
Hogs	10	Game	2,613	Molasses, gal	919	Coal	27
Wheat, cars	7	Tallow	920	Cream	1,500	Junk	1
Corn	4	Poultry	833,776	Cider, bris	1	Sand	1
Oats	44	Eggs, doz	266,720	Apples	209	Other	7
Hay	11	Butter, lbs	104,380	Lumber, cars	43	Misc., lbs	577,401
Mixed grain	3	Cheese	200				

No report of shipments from Glenwood over the Wabash.

SCOTLAND.

Area, taxable	278,175 acres
Land, per cent in cultivation	95
Principal agricultural products	Grass, corn, oats
Principal live-stock	cattle, horses, hogs
Topography	level to undulating
Population	12,674
Assessed valuation	$3,945,925
No. horses and mules	13,935
Cattle	21,093
No. sheep	10,439
Hogs	10,876
Schools operated	76
Teachers	108
Pupils	4,137
Amount expended for schools, 1894	$20,339.16
Permanent school fund	50,056.34
Average annual precipitation	36 inches
Annual mean temperature	50 degrees

SHIPMENTS.

Cattle, cars	172	Rye and barley	4	Tallow	2,505	Ties	26
Hogs	145	Hay	10	Poultry	632,511	Logs	1
Horses and mules	79	Mixed grain	1	Eggs, doz	229,087	Wood	26
Sheep	25	Tobacco, lbs	2,225	Butter, lbs	28,627	Hoops	3
Mixed live-stock	191	Wool	763	Feathers	250	Brick	15
Bl'd horses, head	2	Hides	52,250	Timothy seed, bu	1,213	Stone	5
Hogs	10	Flour	8,000	Cucumbers, cars	5	Junk	1
Wheat, cars	5	Corn-meal	1,800	Molasses, gal	320	Other	2
Corn	19	Game	445	Beer	17,911	Misc., lbs	369,719
Oats	77	Lard	100	Lumber, cars	7		

SCOTT.

Area, taxable	260,365 acres
Land, per cent in cultivation	70
Principal agricultural products	Corn, wheat, timothy, clover, melons
Principal live-stock	Cattle, hogs, horses, mules
Minerals developed	lithograph stone
Topography	35 per cent broken; remainder level to undulating
Population	11,228
Assessed valuation	$2,900,739
No. horses and mules	6,043
Cattle	8,890
Sheep	1,019
Hogs	20,714
Schools operated	43
Teachers	53
Pupils	4,145
Amount expended for schools, '94	$20,047.87
Permanent school fund	21,954.56
Average annual precipitation	44 inches
Annual mean temperature	57 degrees

SHIPMENTS.

Cattle, cars	51	Wool, lbs	600	Poultry	20,487	Oil, lbs	55,510
Hogs	36	Furs	110	Eggs, doz	7,910	Potatoes, brls	202
Mixed live-stock	13	Hides	3,768	Butter, lbs	1,762	Lumber, cars	246
Wheat	387	Flour	9,360,200	Feathers	817	Wood	22
Corn	458	Shipstuff	1,750,000	Clover seed	469	Staves	34
Hay	10	Corn-meal	570,000	Beans, crates	166	Clay	2
Mixed grain	6	Dried fruit	573	Cucumbers	56	Other	4
Melons	1,722	Game	310	Tomatoes	87	Miscel., lbs	55,893
Canteloups	62	Tallow	3,637				

No report of shipments by boat.

SHANNON.

Area, taxable ..... 566,310 acres	No. cattle 7,894
Land, per cent cultivated 10	Sheep 2,247
Principal agricultural products	Hogs 12,775
Wheat, corn, oats, grass	Schools operated 40
Principal live-stock ..... hogs, cattle, horses	Teachers 51
Topography ..... east and north	Pupils 3,199
broken, south and west undulating	Amount expended for schools, '94.. $13,455.61
Population 8,718	Permanent school fund 15,646.42
Assessed valuation $2,009,420	Average annual precipitation ..... 44 inches
No. horses and mules 2,478	Annual mean temperature ..... 56 degrees

SHIPMENTS.

Cattle, cars 5	Lumber 4,879	Wood 4	Other 79
Hogs 8	Piling and ties 49	Stone 17	Misc., lbs 280,000

SHELBY.

Area, taxable ..... 316,904 acres	No. cattle 18,752
Land, per cent in cultivation 84	Sheep 16,422
Principal agricultural products	Hogs 23,525
Corn, wheat, oats, grass	Schools operated 81
Principal live-stock ..... cattle, hogs, horses	Teachers 130
Mineral developed ..... coal	Pupils 5,404
Topography	Amount expended for schools, '94. $31,171.37
Level prairie and rolling timber land	Permanent school fund 68,111.30
Population 15,642	Average annual precipitation ..... 35.6 inches
Assessed valuation $5,667,436	Annual mean temperature ..... 51 degrees
No. horses and mules 15,233	

SHIPMENTS.

Cattle, cars 361	Wheat, cars 1	Poultry 175,208	Lumber, cars 5
Hogs 584	Corn 1	Eggs, doz. 12,170	Hoops 20
Horses and mules .. 99	Oats 40	Butter, lbs 738	Coal 1
Sheep 146	Hay and straw 120	Feathers 1,840	Junk 2
Bl'd sheep, head 6	Veal, lbs 3,905	Seed, bu 800	Misc., lbs 491,988
Hogs 5			

STONE.

Area, taxable ..... 199,926 acres	No. schools operated 52
Population 7,090	Teachers 53
Assessed valuation $988,590	Pupils 3,295
No. horses and mules 4,305	Amount expended for schools, 1894... $8,671.03
Cattle 9,384	Permanent school fund 10,861.16
Sheep 3,379	Average annual precipitation ..... 50 inches
Hogs 15,254	Annual mean temperature ..... 58 degrees

No railroad; products shipped from adjacent counties.

STODDARD.

Area, taxable	526,789 acres
Land, per cent in cultivation	55
Principal agricultural products	Corn, wheat, clover, grass
Principal live-stock	Hogs, cattle, horses, mules
Topography	50 per ct. level, balance rolling
Population	17,327
Assessed valuation	$3,595,839
No. horses and mules	7,839
No. cattle	14,871
Sheep	3,179
Hogs	31,820
Schools operated	76
Teachers	80
Pupils	7,400
Amount expended for schools, '94	$25,055.62
Permanent school fund	33,267.29
Average annual precipitation	44 inches
Annual mean temperature	58 degrees

SHIPMENTS.

Cattle, cars	10	Mixed grain	56	Poultry	53,598	Ties	64
Hogs	20	Melons	1	Eggs, doz	89,221	Staves and bolts	16
Mixed live-stock	189	Tobacco, lbs	926	Cotton seed, cars	28	Posts	1
Bl'd hogs, head	8	Furs	1,743	Vegetables, lbs.	555,125	Brick	20
Wheat, cars	11	Hides	3,702	Oil	9,700	Junk	1
Corn	11	Flour	5,665,544	Cotton, bales	632	Other	30
Corn-chops	2	Game	2,752	Lumber, cars	2,460	Miscel., lbs	1,131,955
Hay	4	Provisions	13,103				

No report from St. Louis, Cape Girardeau and Ft. Smith R. R.

SULLIVAN.

Area, taxable	412,888 acres
Land, per cent in cultivation	93
Principal agricultural products	Corn, wheat, grass, oats, fruit
Principal live-stock	Cattle, hogs, horses, sheep
Mineral developed	coal
Topography	undulating, broken
Population	19,000
Assessed valuation	$5,356,702
No. horses and mules	17,009
No. cattle	42,061
Sheep	10,836
Hogs	14,294
Schools operated	111
Teachers	134
Pupils	6,910
Money expended for schools, 1894	$34,915.41
Permanent school fund	60,843.33
Average annual precipitation	35 inches
Annual mean temperature	52 degrees

SHIPMENTS.

Cattle, cars	533	Pelts	1,050	Feathers	1,795	Hoops	26
Hogs	255	Hides	64,750	Onions, bu	1,506	Brick	3
Horses and mules	29	Flour	91,579	Timothy seed	184	Stone	11
Sheep	38	Shipstuff	106,030	Clover seed	829	Coal	62
Mixed live-stock	19	Corn-meal	200	Fr't & veg., lbs	1,230	Ice	2,300
Bl'd horses, head	8	Beeswax	330	Oil	23,640	Junk	3
Hogs	3	Game	1,067	Apples, brls	714	Other	3
Wheat, cars	2	Tallow	4,490	Lumber, cars	7	Miscel., lbs	1,196,842
Corn	21	Poultry	572,835	Ties	56	Other agricultural products, lbs	50,610
Oats	14	Eggs, doz	344,282	Logs	1		
Hay and straw	1	Butter, lbs	50,452	Other forest products, lbs	164,700		
Wool, lbs	24,165	Dairy products	16,545				

TANEY.

Area, taxable	158,926 acres
Population	7,973
Assessed valuation	$810,966
No. horses and mules	4,193
Cattle	10,757
Sheep	3,562
Hogs	14,874
No. schools operated	50
Teachers	53
Pupils	3,399
Amount expended for schools, 1894	$7,937.35
Permanent school fund	5,038 82
Average annual precipitation	50 inches
Annual mean temperature	58 degrees

No railroad. Much of the products of this county go to Chadwick, in Christian county.

TEXAS.

Area, taxable	602,024 acres
Land, per cent in cultivation	45
Principal agricultural products	Wheat, corn, grass, fruits
Principal live-stock	horses, cattle, hogs
Minerals	iron
Topography	mountainous to undulating
Population	19,406
Assessed valuation	$3,274,064
No. horses and mules	8,877
No. cattle	20,438
Sheep	17,470
Hogs	32,935
Schools operated	121
Teachers	130
Pupils	8,263
Amount expended for schools, '94	$27,419.79
Permanent school fund	19,369.75
Average annual precipitation	44 inches
Annual mean temperature	56 degrees

SHIPMENTS.

Cattle, cars	37	Flour, lbs	30,000
Hogs	50	Lumber, cars	2,523
Horses and mules	18		
Ties	842	Other	16
Wood	7	Miscel., lbs	510,000

VERNON.

Area, taxable	515,414 acres
Land, per cent in cultivation	85
Pincipal agricultural products	Corn, wheat, oats, flax, castor beans
Principal live-stock	Cattle, hogs, sheep, horses
Mineral developed	coal
Topography	gently undulating
Population	31,505
Assessed valuation	$8,195,935
No. horses and mules	20,254
No. cattle	25,656
Sheep	3,290
Hogs	18,672
Schools operated	139
Teachers	205
Pupils	9,893
Amount expended for schools, 1894	$68,273.63
Permanent school fund	96,779.07
Average annual precipitation	40 inches
Annual mean temperature	55 degrees

SHIPMENTS.

Cattle, cars	611	Tobacco, lbs	800	Eggs, doz	136,514	Saw-dust	8
Hogs	724	Wool	3,760	Butter, lbs	20,417	Brick	301
Horses and mules	94	Pelts	730	Cheese	555	Stone	10
Sheep	7	Hides	161,061	Feathers	1,350	Zinc	211
Mixed live-stock	94	Flour	2,360,023	Sorghum seed, cars	6	Coal	199
Bl'd sheep, head	2	Shipstuff	50,000	Cabbage, lbs	120,500	Pottery	9
Hogs	46	Corn-meal	8,002	Blackberries, cr	5	Ice	1
Wheat, cars	125	Nursery stock	110,190	Strawberries	38	Junk	6
Corn	413	Castor beans	472,019	Gooseberries	1	Clay	215
Oats	178	Game	7,162	Molasses, gals	10,236	Coke	3
Flax seed	112	Provisions	20,000	Apples, brls	834	Other	9
Broom-corn	3	Tallow	6,500	Potatoes	1,352	Miscel., lbs	969,840
Hay	1,492	Grease	1,000	Lumber, cars	8	Moulding, cars	2
Mixed grain	7	Poultry	501,031	Wood	138		

WARREN.

Area, taxable	254,080 acres
Land, per cent cultivated	57
Principal agricultural products	Wheat, corn, oats, clover, fruit
Principal live-stock	Hogs, cattle, horses, mules
Topography	level to broken
Population	9,913
Assessed valuation	$3,117,577
No. horses and mules	5,187
No. cattle	9,301
Sheep	5,511
Hogs	13,848
Schools operated	60
Teachers	60
Pupils	3,209
Amount expended for schools, '94	$16,584.85
Permanent school fund	18,440.25
Average annual precipitation	38 inches
Annual mean temperature	54.1 degrees

SHIPMENTS.

Cattle, cars	90	Pelts	5,885	Eggs, doz	321,294	Chair timber, cars	58
Hogs	98	Hides	57,367	Butter, lbs	14,263	Ties	746
Horses and mules	16	Flour	1,205,275	Feathers	1,205	Logs	7
Sheep	15	Corn-meal	1,300	Clover seed, bu	695	Wood	62
Mixed live-stock	84	Nursery stock	750	Raspberries, crates	30	Hoops	24
Calves	75	Dried fruit	2,070	Blackberries	35	Posts	37
Wheat, cars	527	Pork	54,176	Strawberries	10	Stone	1
Corn	24	Veal	11,500	Molasses, gal	150	Junk	2
Oats	4	Game	700	Wine	44	Clay	108
Flax seed	2	Lard	10,192	Beer	40	Other	15
Mixed grain	23	Tallow	7,315	Apples, brls	284	Miscel., lbs	134,431
Wool, lbs	13,921	Poultry	250,602	Potatoes	28		

WASHINGTON.

Area, taxable	464,953 acres
Land, per cent in cultivation	30
Principal agricultural products	Corn, wheat, grass
Principal live-stock	cattle, hogs, horses
Mineral developed	lead
Topography	broken
Population	13,153
Assessed valuation	$2,827,967
No. horses and mules	4,902
No. cattle	12,535
Sheep	4,940
Hogs	11,819
Schools operated	68
Teachers	77
Pupils	4,500
Amount expended for schools, '94	$18,801.53
Permanent school fund	38,271.82
Average annual precipitation	42 inches
Annual mean temperature	54 degrees

SHIPMENTS.

Cattle, cars	52	Hides	29,731	Poultry	140,053	Hoops	2
Hogs	28	Flour	200,900	Eggs, doz	32,483	Brick	1
Sheep	6	Shipstuff	40,000	Butter, lbs	9,579	Cooperage	1
Mixed live-stock	13	Canned fruit	600	Feathers	193	Pig-lead	29
Bl'd sheep, head	9	Beef	350	Clover seed, bu	409	Lead ore	195
Calves	4	Pork	2,035	Cream, gal	230	Slag	7
Wheat, cars	25	Veal	3,320	Milk	1,105	Charcoal	60
Hay	7	Game	9,318	Wood, cars	63	Other	5
Wool, lbs	31,334	Provisions	1,000	Staves	3	Misc., lbs	17,784
Pelts	495	Tallow	300				

WAYNE.

Area, taxable	477,566 acres
Land, per cent in cultivation	30
Principal agricultural products	Wheat, corn, oats, grasses, fruit
Principal live-stock	Horses, cattle, mules, hogs
Mineral	iron
Topography	broken; some level bottoms
Population	11,727
Assessed valuation	$2,854,827
No. horses and mules	4,600
No. cattle	11,167
Sheep	5,272
Hogs	21,597
Schools operated	63
Teachers	69
Pupils	4,516
Amount expended for schools, '94	$17,553.43
Permanent school fund	19,325.66
Average annual precipitation	44 inches
Annual mean temperature	56 degrees

SHIPMENTS.

Cattle, cars	140	Flour	800,000	Strawberries, cr	92	Granite	2
Hogs	25	Dried fruit	4,000	Lumber, cars	2,717	Iron	1
Sheep	2	Beef	495	Piling	134	Cooperage	9
Bl'd hogs, head	1	Game	10,870	Ties	86	Yellow pine edgings	58
Hay	28	Poultry	39,320	Wood	4	Lime	3
Pelts	994	Eggs, doz	34,880	Hoops	4	Other	29
Hides	17,681	Feathers, lbs	1,828	Stone	2	Miscel., lbs	88,534

No report from St. Louis, Cape Girardeau and Ft. Smith R. R.

WEBSTER.

Area, taxable	347,642 acres
Land, per cent in cultivation	44
Principal agricultural products	Hay, corn, wheat, tobacco, fruit
Principal live-stock	Cattle, hogs, horses, sheep
Minerals developed	lead
Topography	undulating to broken
Population	15,177
Assessed valuation	$3,191,229
No. horses and mules	9,665
No. cattle	13,329
No. sheep	13,247
Hogs	22,862
Schools operated	78
Teachers	92
Pupils	5,895
Amount expended for schools, 1894	$24,950.05
Permanent school fund	27,185.58
Average annual precipitation	44 inches
Annual mean temperature	56 degrees

SHIPMENTS.

Cattle, cars	40	Hay	2	Butter, lbs	9,650	Wood	927
Hogs	104	Wool, lbs	32,889	Cheese	60	Posts	1
Horses and mules	21	Hides	9,930	Feathers	9,260	Stone	3
Sheep	19	Flour	946,340	Apples, brls	150	Ice	400
Mixed live-stock	109	Game	84,045	Potatoes	266	Brick and sand	33
Wheat	120	Poultry	285,221	Lumber, cars	120	Other	16
Corn	2	Eggs, doz	105,300	Ties	513	Miscel., lbs	436,000

WORTH.

Area, taxable	169,475 acres
Land, per cent in cultivation	.92
Principal agricultural products	Corn, wheat, oats, grass
Principal live-stock	cattle, hogs, horses
Topography	undulating
Population	8,738
Assessed valuation	$2,542,995
No. horses and mules	9,681
Cattle	16,132
No. sheep	6,045
Hogs	10,202
No. schools operated	58
Teachers	77
Pupils	3,128
Amount expended for schools, 1894	$20,666.33
Permanent school fund	29,805.68
Average annual precipitation	33 inches
Annual mean temperature	48 degrees

SHIPMENTS.

Cattle, cars	117	Corn	198
Hogs	161	Oats	5
Horses and mules	1	Hay	23
Sheep	5	Mixed grain	17
Mixed live-stock	88	Hides, lbs	1,446
Wheat, cars	3		
Game	320	Butter	2,645
Poultry	45,900	Blackberries, cr	100
Eggs, doz	7,220	Apples, brls	1,040
Dairy produce and eggs, lbs	44,000	Junk	1
		Miscel., lbs	3,818

Mixed live-stock, wool, pelts and hides not reported from Grant City.

WRIGHT.

Area, taxable	369,740 acres
Land, per cent in cultivation	25
Principal agricultural products	Corn, wheat, timothy, clover, fruit
Principal live-stock	hogs, cattle, sheep
Minerals developed	Lead and zinc in limited quantities
Topography	South part broken, north undulating
Population	14,484
Assessed valuation	$2,763,279
No. horses and mules	7,872
Cattle	15,124
Sheep	13,360
Hogs	23,211
Schools operated	91
Teachers	100
Pupils	6,364
Amount expended for schools, '94	$23,219.75
Permanent school fund	38,375.91
Average annual precipitation	33 inches
Annual mean temperature	56 degrees

SHIPMENTS.

Cattle, cars	118	Corn	1
Hogs	163	Hay	1
Horses and mules	57	Flour	2,760,000
Wheat	2	Apples, brls	192
Lumber, cars	106	Lead ore and zinc	4
Ties	499	Coal	2
Wood	148	Other	135
Brick and sand	2	Miscel., lbs	1,278,000

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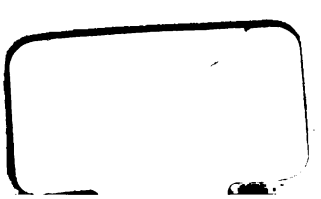
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